Goulstonian Lectures

ON THE STUDY OF

GASTRIC FUNCTION IN HEALTH AND DISEASE.

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LECTURE I.*

THE physiology of the human stomach has acquired so vast a literature since Beaumont's day that the most earnest student could scarcely hope to acquaint himself with all its history, much less to assimilate and to analyse the countless observations and experiments upon which our knowledge has been based. When, therefore, I received the honour of being called to deliver these lectures and decided, not without misgivings, to attempt such a survey as my title suggests, I felt that some explanation of my choice and purpose and of the scope of the undertaking would surely be required of me.

In my choice I was mainly influenced by the nature and the results of certain studies which have claimed my attention during the past five years. For the most part these studies have been of a clinical kind, but it was also my good fortune, at the suggestion of my colleague and teacher, Dr. A. F. Hurst, to be the first to introduce into this country in 1920 the fractional method of gastric analysis devised by Rehfuss and originally described by him in 1914. The investigations with this method in which I have been concerned may be grouped under three headings: (1) an inquiry into normal gastric function (in collaboration with Dr. T. Izod Bennett) based on an examination of 100 healthy men; (2) a collateral and subsequently extended inquiry into the various disturbances of gastric function encountered in the ordinary course of hospital and private practice; and (3) a short series of experiments on myself.

I was further influenced by a belief that something in the nature of a review of recent work on human gastric function might be of value, and even that it might be possible, on the basis of such a review, to formulate a clearer doctrine and a more scientific classification of the dyspepsias than is at present furnished in the text-books of general medicine.

During the past 10 or 15 years medicine may be said to have re-entered upon a physiological phase. Less dependent than formerly upon information acquired in the post-mortem room or available by means of animal experiment, we have turned with a new zest to the more practical study of function, both normal and abnormal, in the living human subject. The physiology of symptoms and the early evidences of perverted activity in one viscus or another are now being widely investigated, and seldom have better conditions obtained for useful collaboration between the physiologist and the physician.

The most important contributions to the study of gastric motility and sensibility include those of Cannon and Carlson in America and of Hurst in this country, while Rehfuss and his collaborators, and Crohn, with the fractional method, have initiated a new line of inquiry into the secretory and chemical phenomena of digestion. In addition, valuable contributions have been made by radiologists and surgeons. It must, however, be admitted that the general effect of all these researches has been rather to diffuse than to crystallise information, and that practical medicine has to some extent suffered in consequence. As so commonly happens, the introduction of new methods has stimulated expectation to march in advance of reason. On the basis of new tests the old error of according to a symptom the dignity of a diagnosis has been revived; we find, for instance, even in recent literature, hyperchlorhydria and achylia discussed as clinical entities instead of as symptoms of various underlying pathologies. At one period and another radiography and the test-meal have been too highly appraised, and almost inevitably there has resulted a tendency not only to under-rate the importance of clinical observation, but even to disregard clinical data, the very interpretation of which should have been enhanced by the introduction of these methods. Operations have been devised and performed without proper regard for physiological principle, and certain ill-results of surgical interference have been regretted without being studied.

These errors in thought and practice, as is the case with all such errors, are to be traced to lack of accurate knowledge, to lack of correlation of existing information, and to a too frequent exaltation of theory. In the words of John Abercrombie,[1] "The best way of avoiding the errors which have been referred to, will probably be to keep in mind the important principle, that the object of physical science 'is to ascertain the universality of a fact.'" The closer intimacy which now obtains between clinical and physiological research should help to foster this principle.

I shall endeavour, wherever possible and whether dealing with subjective or objective phenomena, to trace the transition from the normal to the abnormal, and to bear in mind the conception so vigorously fostered by the late Sir James Mackenzie[2] that symptoms are best viewed as expressing disturbances of normal reflex mechanisms. Throughout I shall try to confine myself to considerations of the problem having a practical bearing. To the chemical and bactericidal properties of the gastric juices I shall not refer, for it would take too long and be beyond my scope to discuss them in detail. With structural disease of the stomach, excepting in so far as it is necessarily prominent among the causes of disturbed function, I propose in no wise to concern myself. Nor do I intend to discuss the study of gastric behaviour in animals.

With so much by way of introduction I need only add that the first lecture will deal with the study of the normal gastric responses, and the second and third lectures with the study of the gastric responses to disease.

THE SENSORY FUNCTIONS OF THE STOMACH.

The functions of the stomach may be conveniently reviewed under the three headings—Sensory, Motor, and Secretory. The first and almost the only indication vouchsafed to the individual that these functions are healthy or deranged is the state of his own sensations. In health he is for the most part unaware of his stomach excepting when hunger, satisfaction, or repletion tell him that it is empty, comfortably filled, or over-filled. In disease of many kinds he is reminded of its presence by such symptoms as pain, nausea, vomiting, flatulence, regurgitation, and loss of the desire for food. All of these symptoms may occur in the presence or absence of organic disease of the stomach itself. They therefore indicate derangements of function which may be produced either by local or distal stimuli. It is of the first importance to consider what is the actual significance of these sensations, and such considerations should properly precede a review of the objective evidence. It has long been supposed, and finally established by Hurst[3] and others, that the mucosa of the stomach is insensitive to ordinary tactile, thermal, and chemical stimuli, and yet daily experience tells us that the organ possesses a sensibility of its own. Of the sensations which we may associate in whole or in part with the healthy stomach there are only four. These are the gastric elements of hunger, appetite, satisfaction, and repletion. Nausea, it is true, may be induced in an otherwise healthy person by disgustful emotions, and it also accompanies normal pregnancy; I have, however, deemed it better to regard it as a symptom of disordered function.

* Lectures II. and III. will appear in subsequent issues of THE LANCET.

Hunger and Satisfaction.

The most important contribution of the past decade to the study of hunger is to be found in the writings of Carlson,[4] published in book form in 1916. As the result of an exhaustive series of experiments and graphic records obtained with the aid of balloons introduced into the stomach, he concludes that the local element in the sensation of hunger is dependent upon the tonus and peristaltic contractions of the gastric musculature, his work confirming and supplementing the earlier findings of Cannon and Washburne.[5] His experiments included frequent observations on a healthy man with a gastric fistula, on himself and colleagues, on individuals at various ages and in various conditions of impaired health, and on lower animals. It is open to any one of us by the simple experiment of fasting to appreciate the rhythmical character of the hunger sensation. That this rhythmical sensation is associated with an increase in peristalsis and intragastric tension is shown by the occurrence during the hunger phase of borborygmi and of frequent small eructations due to displacement of some of the air from the fundic air-bubble. Although not subscribing to the view that the stomach is insensitive to thermal stimuli, Carlson otherwise confirms the observations of Hurst that the main element in the production of gastric sensibility is muscular tension. Intragastric and also muscular tension may obviously be influenced by many factors, including the tonic and peristaltic activity and the elasticity of the stomach wall itself, the nature and bulk and rate of introduction of the stomach contents, and the patency or otherwise of the pyloric and cardiac sphincters. Upon various combinations and modifications of these factors and upon disturbances of motor rhythm the majority of all gastric sensations, whether normal or morbid, depend, the sensations in each instance originating in the muscle-fibre and being conducted by the nerves distributed to it. Similar properties pertain to all the hollow viscera, and indeed it would be natural to suppose with all of them that the most essential perception of which they should be capable is the perception of states of emptiness and fullness, and of muscular hypertonus and hypotonus. Appreciation of tonus (or posture) and of tension for them is as important physiologically as is the appreciation of light and colour by the eye, of sound by the ear, of touch by the skin, and of position and tension by the skeletal muscles. In brief, the special sense of the hollow viscera, as Hurst and Carlson have demonstrated, and as Brinton[6] surmised nearly 70 years ago, is their particular form of muscle-sense. In the case of the rectum or the bladder the state of emptiness is the state of comfort or "unawareness," but evacuation is their obvious function. The main function of the stomach is to replenish, and so the state of comfort is satisfaction. Satisfaction occurs when the stomach walls are adequately relaxed so as to enclose or grasp a meal of appropriate bulk and consistency. It does not necessarily follow that emptying of the stomach is immediately succeeded by an increase of tonus sufficient to induce hunger, but too prolonged emptiness results in tonic and peristaltic contractions of a degree sufficient to awaken consciousness in the form of the hunger discomfort, and this at times may even become a painful sensation.

Repletion.

Repletion may give rise to sensations which are mildly uncomfortable or definitely painful, and is experienced when the stomach is overfilled or too rapidly filled with a normal quantity of food or fluid. Gross and rapid over-eating may conceivably, but very exceptionally, cause distension and stretching of muscle fibres; in fact, dilatation of the healthy stomach from over-eating is probably as rare as dilatation of a healthy heart from over-exertion. Generally the sensations of repletion depend upon an increase in tension due to the fact that muscular relaxation has not proceeded *pari passu* with the introduction of food or fluid.

Appetite.

Although such a distinguished and careful observer as Beaumont[7] stated that "Appetite and hunger belong to the same class of sensations; they differ only in degree," modern observers regard the sensations as having a separate nature and origin. To such an extent do physicians rely on appetite as an index of physical health and loss of appetite as a symptom of physical disease, that it is a matter for some surprise that closer attention is not paid by Carlson to the question of its genesis, and that he seems to stress the psychic elements in its production at the expense of the gastric elements.

The following are the essential differences between the sensations of appetite and hunger. The first is a pleasant sensation; the second unpleasant. The first may occur in an adequately fed subject, may be present even when the stomach contains food in plenty, is stimulated rather than diminished by pleasant foods and beverages, and is only abolished by repletion. The second results only from undue abstention from food or excessively rapid utilisation of food, is absent when the stomach is filled, and is relieved by eating. The first is a daily experience in health; the second is only an occasional experience under the usual conditions of civilised life. The first has a sustained quality; the second is felt as a recurring or intermittent sensation.

Other senses besides taste may stimulate appetite, and in man sights, smells, sounds, and the general sensory comforts of pleasant environment may all react in its favour. To a great extent it is undoubtedly a "conditioned reflex." The localisation of the appetite sensation is not so accurate as that of the hunger sensation, but this is partly because it is a less clamant spokesman. Some refer it to the pharynx or œsophagus, some to the epigastrium, or to all three. Personally I experience the sensation mainly in the gastric zone. In any case the ability to localise it at all indicates the possibility that, as with hunger, there may be a local visceral process concerned, and there are various clinical, radiographic, and pathological observations which lend support to the view that appetite, while differing from hunger in many respects, has also a local origin in the upper alimentary tract. These observations point to the tonic activity of the gastric and perhaps the œsophageal plain muscle as the probable factor, while, for the appreciation of hunger, peristaltic activity is—as Carlson's experiments suggest—a necessary addition. Appetite may occur without hunger, but hunger seldom, if ever, occurs without appetite. Peristaltic activity (in the same manner as the activity of skeletal muscles) requires for its initiation a certain degree of tension or postural tonus. It may be urged, too, that just as general well-being and preparedness for physical effort are associated in idea and fact with a favourable state of tonus and adaptability of the skeletal muscles, so too digestive well-being and preparedness for digestive effort are associated with a favourable state of what may be termed "anticipatory" tonus in the plain muscle of the stomach or upper alimentary tract generally. Certainly there is a close interrelationship between the two states, for general well-being and good appetite are associated phenomena, and it will be agreed that appetite is stronger in the vigorous athletic type of individual and that it varies directly with constitution and habit. Gastric tonus from the radiographic point of view shows a similar variation with physical type.

In support of the view that appetite is related to gastric tonus we also have radiographic evidence in certain diseases accompanied by poor or by excessive appetite. Thus hypotonus is a very common finding in sufferers from pulmonary tuberculosis and other debilitating conditions in which appetite is diminished. Conversely in conditions such as duodenal ulcer, in which appetite is increased, hypertonus is frequently recorded. Hypertonus is also described in diabetes. Barclay,[8] on the basis of radiographic observations, relates the appetite sensation to gastric tonus, and has visualised tonic adaptation in response to such

appetite stimuli as the exhibition of savoury foods or even the mention of a glass of beer to hospital patients.

Of all the diseases in which loss of appetite is liable to develop, in none is it more constant or pronounced than carcinoma ventriculi. Brinton[6] states that it is present in 85 per cent. of cases. The greater the infiltration of the stomach wall the more profound is the anorexia. Needless to say, anorexia is encountered in malignant disease elsewhere, but generally in the later cachectic phases. In carcinoma of the stomach it is often an early symptom. In "leather-bottle" stomach it may be the only symptom, and may occur independently of any extreme loss of weight, anæmia, or other factors, such as pain and sickness, which would be calculated to induce a secondary anorexia. The following case appears to me to support the contention that appetite may be a particular function of the stomach:—

A man in the middle forties had complained for two years of complete loss of appetite. He was leading throughout this period an energetic life, both physically and mentally. He played games with vigour, but no measures which he could adopt and no treatment prescribed produced the slightest amelioration of his symptom. He had no pain, and his loss of weight was not more than could be accounted for by his diminished intake of food. On clinical and radiographic evidence and the discovery of a complete achlorhydria a diagnosis of "leather-bottle" stomach was made, and at operation the typical appearances of this condition were revealed.

In such a condition the function of tonic adaptability is obviously entirely destroyed; in this special instance the only concomitant symptom was complete destruction of appetite. The anorexia which accompanies acute fevers, fatigue, and neurasthenia is due partly to a relaxation of tonus, which may be present also in the skeletal muscles, and partly to the nervous depression. In a case of advanced "anorexia nervosa" I have seen an unusual degree of atony, or, more correctly, of hypotonus, demonstrated radiographically. In such cases physical exhaustion combines with the perverted and depressed emotions in bringing about the loss of tonus. A similar asthenia probably operates in the case of hunger-strikers and professional fasters, who notoriously lose their appetite in the later stages of their fast. It should, however, be mentioned that Carlson[4] demonstrated both in man and dogs a tendency to increasing tonus and peristaltic vigour during starvation, and that this persisted when the hunger and appetite sensations had become enfeebled. He attributes this to depression of the central nervous system: it has, however, occurred to me that diminishing adaptability in the muscle coincident with the steadily amplifying tonus (just as with extreme hypotonus or with rigidity of the stomach wall) may be a partial explanation, for a healthy or normal tonus is that from which a normal movement or adaptation can most readily be initiated. Pavlov[9] showed with animals that appetite stimuli were capable of producing a secretory response, and since secretory and motor responses are both of vagal origin and commonly show a parallel behaviour, it is highly probable that there exists a simultaneous muscular response. Even admitting that there is a strong psychic and memory element in the production of appetite, it seems justifiable to submit that there is also a stimulus transmitted to the gastric musculature which enhances its tone to a sufficient degree to waken consciousness. The necessary degree of tonic activity may be extremely slight and not easily susceptible of demonstration, but when it is considered how small and insignificant are the degrees of tonus in a skeletal muscle which serve to inform us of its posture or the stresses opposed to it the hypothesis becomes at least a reasonable one.

Beaumont[7] suggested that hunger and appetite might be due to distension of the gastric glands or blood-vessels. Possibly the sudden sensation of warmth or "glow" in the epigastrium, which is sometimes felt at the beginning of a pleasant meal and which is more constantly induced by alcohol, may be associated with this phenomenon, but the sensation to my mind is quite different from the appetite sensation.

Briefly, to summarise the view of the gastric appetite sensation which I have endeavoured to sketch we may say that *the sensation is in part a memory process and in part a local manifestation of efficient gastric tonus reflexly induced by the memory stimulus, or by the more direct stimulus of seeing, smelling, tasting, or swallowing food, or by some combination of these factors.*

I have digressed into a discussion of appetite because the gastric elements in its production seem to me to have been undervalued, and because in the clinical study of general and gastric disorders we have long been accustomed to rely upon its presence, perversion, or absence as being of such peculiar diagnostic and prognostic significance.

In the foregoing sections frequent use has been made of the word tonus, and it is desirable that the term should be used in its most accepted sense. Sherrington[10] quotes Hughes Bennett's[11] definition of "reflex muscular tonicity" as being "that slight constant tension which is characteristic of healthy muscle." In Sherrington's words "reflex tonus is in short reflex posture." The recent investigations of Hunter[12] and Royle[13] have shown that the maintenance of posture both in skeletal and visceral muscle is a function of the sympathetic.

When the stomach is filled so as to raise the intragastric tension, the tension, as demonstrated by Moritz,[14] quickly falls again to its previous level by an adaptation of the musculature so as to accommodate comfortably the increased content. The state of tension of the stomach muscle is its postural tonus, and, as Sherrington points out, we might speak of its "quarter-pint" and "half-pint" postures. Tonus and tension are not synonymous, for, without altering its posture, the tension in a muscle-fibre may be raised by the application of an external pressure or a stretching force. By the automatic regulation of intragastric and muscular tension we are in health spared from experiencing all symptoms—apart from those which we rather dimly appreciate in the guise of hunger, appetite, and satisfaction, and which depend upon an exaggeration or reduction of muscular tension of one kind and another inadequate for the production of real pain or discomfort. If, however, the stomach be too rapidly filled, or be allowed to remain too long empty, or if through exaggerated vagal stimulation in physical disease or emotional stress, or from other causes, a condition of exaggerated tension results, then discomfort or pain is developed.

The conception that the secretory behaviour of the stomach or the chemical reactions of its contents may directly influence sensibility is discounted in many ways. Hurst[8] showed that with the single exception of alcohol none of the chemical stimulants which he employed, including hydrochloric acid in the highest physiological concentration, are capable of promoting gastric sensibility. In the series of 100 healthy men investigated by Bennett and Ryle[15] every variety of secretory response was encountered. In four cases there was complete achlorhydria throughout the test. In another group the readings were so high as to have suggested, on earlier conceptions, some pathological condition. All of these men were free from dyspeptic symptoms, and the only one of them who mentioned an unusual readiness for meals was one of a small group showing a normal range of acidity but an unusually rapid rate of emptying.

In the light of existing knowledge it thus becomes fair to conclude that we have in the "symptoms of health"—hunger, appetite, satisfaction, and repletion, and the readiness with which they appear and disappear—a measure not only of the muscular sensibility, but also of the muscular and motor efficiency of the stomach; but these symptoms give no index of its secretory behaviour.

THE MOTOR FUNCTIONS OF THE STOMACH.

Radiographic examination of the stomach after an opaque meal has probably contributed more to the accurate diagnosis of organic gastric disease than any other method of physical inquiry excepting surgical exploration. Its contributions to the study of gastric function have been less valuable and some of its earlier conclusions were misleading. This was due mainly to an inadequate study of the normal. Until recently most of the literature of gastric radiology has been provided by observers concerned with the examination of patients and often unconsciously actuated by the desire to make a diagnosis, or at least to find an explanation for symptoms for which the clinician had not provided a suitable explanation.

It is now recognised that the normal stomach may present a wide variety of appearances after the administration of a bismuth or barium meal; that the same stomach may behave differently on different occasions; and that a number of conditions formerly reported as abnormal are really consistent with perfect health. Hurst and Morton,[16] as long ago as 1907, drew attention to the great variations found in healthy students during radiographic examinations of the alimentary tract. If at an earlier date a large series of healthy men and women had been carefully examined and reported upon we should have been spared many difficulties and doubts in clinical work. The functions of the stomach which may be observed radiographically are its tonus, peristaltic activity, and emptying-rate.

The *tonus* of the stomach may to some extent be judged from the position, size, and shape of its shadow. Of these the position alone is easily measurable; in the normal attitudes of health it is only influenced in a very small degree by the state of the abdominal musculature and other external factors. An important investigation has been published by Moody, Van Nuys, and Chamberlain,[17] who examined 600 healthy men and women, described remarkable variations, and concluded that the use of such terms as gastroptosis is unjustifiable, and that the position of the stomach may be so low or so high in healthy persons that these variations cannot in themselves be regarded as evidence of disease. Table I. briefly epitomises their findings.

TABLE I.—(*Moody, Van Nuys, and Chamberlain.*)
Position of the Stomach in 600 Men and Women Students.

Position of the greater curvature with reference to the iliac crests.	Percentage of subjects (nearest whole figure).	
	Men.	Women.
More than 2 inches above	2	1
,, ,, 1 inch ,, ...	5	2
Less ,, 1 ,, ,, ...	18	10
Less than 1 inch below..	23	19
More ,, 1 ,, ,, ...	27	21
,, ,, 2 ,, ,, ...	16	22
,, ,, 3 ,, ,, ...	6	17
,, ,, 4 ,, ,, ...	3	8

It will be noted that hypertonus, as would be expected, on ordinary clinical experience, is more commonly an attribute of the male sex and hypotonus of the female sex. Employing Schlesinger's [18] classification into orthotonus, hypertonus, and hypotonus, Moody, Van Nuys, and Chamberlain found in their male series that orthotonus was present in 79 per cent. of cases; hypertonus in 17 per cent.; and hypotonus in 4 per cent. It is interesting to compare these figures with those obtained in the normal series of Bennett and Ryle,[15] who found normal secretory curves in 80 per cent. of cases; hyperchlorhydria and high normal curves in 15 per cent.; and hypochlorhydria and achlorhydria in 5 per cent. In their female series Moody, Van Nuys, and Chamberlain found orthotonus in 78 per cent.; hypertonus in 7 per cent.; and hypotonus in 15 per cent.

Campbell and Conybeare [19] examining independently the same group of healthy students by means of the fractional test-meal and radiographically, were able to demonstrate a definite relationship between hypertonus and hyperacidity on the one hand and hypotonus and hypoacidity on the other. They also correlated these phenomena with gastric motility and the general physique of the individual. Hypertonus, hyperacidity, and rapid emptying (of barium) occurred most frequently in men of the broad-chested, vigorous, athletic type; hypotonus, low acidity, and slow emptying (of barium) for the most part in narrow-chested men below the average of physical development, and not taking regular exercise. Between these extreme types was a much larger group showing normal tonus and normal acidity. Tables II. and III. illustrate certain of their findings.

TABLE II.—(*Campbell and Conybeare.*)
Showing the X Ray Findings in 50 Men with Hyper- or Hypochlorhydria Compared with the Normal.

—	Percentage found in which the stomach was—		
	High or rapidly emptying.	Normal.	Low or slowly emptying.
Of six men with hyperchlorhydria (Group 6). ..	67	33	0
Of 39 men in whom the stomach was normal (Groups 3, 4, 5)	15	70	15
Of five men with hypochlorhydria (Groups 1 and 2)	40	0	60

TABLE III.—(*Campbell and Conybeare.*)
Showing that in Most Cases a Subject who was Picked Out as Unusual by X Rays was also Unusual by His Test-meal.

—	Percentage found as normal by test-meal.	Percentage found unusual—i.e., Groups 1, 2, or 6.
Of 31 subjects normal by X rays	93	7
Of 15 subjects unusual in one particular by X rays	60	40
Of eight subjects unusual in both particulars by X rays	38	62

The association of particular gastric appearances with particular physical attributes has long been recognised by radiologists. In a less distinct way the association of physical type and certain dyspepsias has long been observed by physicians, who would, perhaps, go further and associate certain temperaments and nervous attributes with certain physical and dyspeptic types. Thus it would, I believe, be agreed that the patient with duodenal ulcer is frequently either of the vigorous, broad-chested type, or lean and nervous and fittingly described as a "hypertonic" individual, and that he commonly shows brisk and even exaggerated tendon reflexes. At the opposite end of the scale the female patient with visceroptosis may be described as "hypotonic" and commonly shows sluggish tendon reflexes. With normal subjects there have not, so far as I have been able to ascertain, been any previous anthropometric studies of such a complete kind as those of Campbell and Conybeare, and Moody, Van Nuys, and Chamberlain. Carman,[20] from the point of view of the clinical radiologist, writes as follows: "Thus I feel that the chief test by which the stomach is to be adjudged of normal tone is its *correspondence to the habitus of the individual*, and not its form, size, and position alone. With the broad habitus the tone may vary from orthotonus to hypertonus. With the normal habitus it may be expected to vary from orthotonus to at least slight degrees of hypotonus. With the enteroptotic habitus, hypotonus is the rule. . . ." The observations quoted above lend strong support to this useful generalisation.

If the recognition of variations in different individuals is important the recognition of variations in the same individual at different times and under varying conditions is equally so. Barclay,[8] in a valuable dissertation on the normal stomach, emphasises the need for greater familiarity with these variations, and states that: "The alterations possible in the shape and size of the normal stomach are many, and apart from displacements such as by collections of air in the intestines, they are almost all due to variations in tonic action." He mentions an experiment on three healthy students conducted by Morison, who reported that the appearances on one occasion were of the normal "J" and "cow-horn" types; on a subsequent occasion "not one of them was of the so-called normal type, various stages of atony being present." Barclay refers also to the remarkable alterations in the shape and position of the stomach as the result of disgusting smells, sudden emotion, and fright, and in association with feelings of faintness. On one occasion he saw the lower border of a normal orthotonic stomach drop nearly 3 inches when the patient was startled by a banging door. He attaches great importance to the tonic action of the oblique fibres of the stomach and suggests for them a sling-like supporting mechanism, quoting the anatomical investigations of Jefferson,[21] and indicating that they probably have a separate purpose and can contract independently of the circular and longitudinal fibres. Even the remarkable "cup and spill" stomach, in which the food collects in the upper portion of the organ and spills over into the lower portion, is referred to by Barclay as "another picture of the normal stomach." He regards this appearance as being due to the action of the oblique fibres "contracting or remaining in posture."

The *peristaltic activity* of the healthy stomach is chiefly a function of the mid-gastric and præ-pyloric portions. It begins shortly after the ingestion of the meal, but its advent may be retarded or even inhibited by nervous states and emotions. The depth of the waves shows wide variations; it is usually greater in association with hypertonus and less with hypotonus. Position may also influence peristaltic activity, which is commonly increased when the subject is lying prone.

Motility or emptying-rate may be usefully studied by radiographic methods, although it is doubtful whether the information thus obtained is as accurate as that furnished by the fractional test-meal. Again, the widest variations are encountered. According to Carman,[20] "It would seem that by no simple test can sharp and constant lines of demarcation be drawn between hypermotility, normal motility, and hypomotility." The conditions of the test must obviously be standardised, for differences in the opaque salt employed, in the bulk and character of the meal, and the management of the patient after its ingestion may all have an influence on the rate of emptying. To Haudek[22] we are indebted for the double-meal method of examination and the establishment of the six-hour limit. With the barium meal usually employed in this country and given to a fasting subject the stomach should be completely empty within six hours. The average emptying-rate in patients without obstructive lesions is considerably less than this and may be said to lie between three and five hours. I have not succeeded in finding a reference to any accurate radiographic study of the emptying-rate and its variations in a long series of healthy men or women, but P. J. Briggs (communicated) in 100 patients without gastric or duodenal disease obtained the following figures. The stomach emptied in two and a half hours in 1 per cent.; in three hours in 6 per cent.; in three and a half hours in 9 per cent.; in four hours in 44 per cent.; in four and a half hours in 32 per cent.; and in five hours in 8 per cent.

The relationship between gastric tonus and emptying-rate is not so definite as might be supposed. A hypertonic stomach does not necessarily empty quickly nor a hypotonic stomach slowly, and much depends on the nature of the meal employed. In health as well as in disease the behaviour of the pylorus is apparently the most important factor regulating the rate of emptying.

Although the fractional test-meal can obviously give no direct information relative to tonic or peristaltic activity, it is a valuable test of motility. Levy[23] advocates the gastric tube as being more accurate than X rays for gauging the emptying-rate of the stomach, and in my own clinical work I have formed the same opinion. As will be shown later, the rate of emptying is the most constant and accurate of all the findings with the fractional method. The average rate of emptying with the standard gruel meal in a healthy man is two hours and the extreme variations are one hour and two and three-quarter hours. Briggs, examining radiographically a group of 20 men from the normal series of students studied by Bennett and Ryle and employing a meal of approximate density to the standard gruel meal, found closely comparable emptying times, the average rate of emptying, irrespective of tone, being two hours and eleven minutes.

The table quoted hereunder (Table IV.) illustrates the rate of emptying as judged by the fractional test-meal in the two series studied by Bennett and Ryle[15] and by Baird, Campbell, and Hern.[24] The extreme variations from the average normal figure are seen to be not more than 50 per cent. of that figure—a much smaller percentage variation than obtains with other measurable quantities, such as gastric acidity. The one hour test of Ewald can obviously give no such accurate estimate of motility.

TABLE IV.—(*Baird, Campbell, and Hern.*)
Rate of Emptying of the Gruel Meal. Figures given as Percentages.

—	Average time of emptying.	1 hr. or before.	Stomach contains no starch at (hours)—						
			1½	1½	1¾	2	2¼	2½	2¾ or later.
This series (57 men)	2·1	5	7	14	9	17	16	10	22
Bennett and Ryle (100 men) ..	1·9	0·6	3	7	13	17	14	18	22
Combined (157 men)	2·0	5·5	4	9·5	12	17	15	15	22

THE SECRETORY FUNCTIONS OF THE STOMACH.

The fractional method of gastric analysis was described by Rehfuss[25] in America in 1914, but did not attract attention in this country until 1919. Since then its numerous advantages over the older one-hour test of Ewald have resulted in its adoption both as a method of physiological inquiry and as an aid to clinical work in many hospitals and schools in this country. Douglas and Priestley[26] have recently incorporated this method in their practical text-book on Human Physiology. It has formed the basis of many gastro-enterological studies in recent years, and with its help many of the classical observations of Pavlov in the case of dogs have now been confirmed in man. Indeed, a voluminous literature of the fractional test-meal has grown up on both sides of the Atlantic, but it has for some reason found less favour on the Continent. It is unnecessary to refer here to the technique, for full descriptions of the method have been given elsewhere.[27 28 26]

The advantages of the fractional method may be summarised as follows:—

1. It permits of accurate measurement of the fasting juice and a study of its mucus, bile, and cell content, together with estimations of its free and total acidity.

2. It provides in graphic form an indication of the chemical processes at each stage of gastric digestion and detects late rises in acidity and such phenomena as continued secretion. By recording the times at which bile-regurgitation occurs it gives an indication of the occurrence of pyloric relaxation and duodenal reflux.

3. It determines with considerable accuracy the emptying rate of the stomach for a standard meal.

4. By combining chloride estimations with those for free and total acidity it furnishes information relating to the factors causing neutralisation and so indirectly again to the functions of the pylorus.

5. In pathological cases the presence of food residue in the fasting specimen, of blood or pus in this or subsequent specimens, the odour of the samples and other physical characters may also be observed.

Amongst the possible fallacies which have to be considered are the following:—

1. The action of the tube as a foreign body in the stomach.
2. The stimulation of excessive salivation which would tend to dilute and to a less extent to neutralise the free acid.
3. Diminution of the psychic secretion by the circumstances of the test and the unappetising character of the meal.
4. Emotional inhibition or exaggeration of secretion during the test.
5. Duodenal regurgitation from retching.
6. Variations from day to day in the curve of a given subject.
7. Variations in acidity at different levels in the stomach.
8. Variations with sex and age.

These will be discussed seriatim.

1. Inert foreign bodies in the stomach do not apparently influence its secretory behaviour. This was demonstrated by Beaumont [7] in the case of man and by Pavlov [9] in the case of animals.

2. A foreign body in the œsophagus may, however, induce a vigorous reflex salivation, and acting in this way, the gastric tube can cause an artificial hypoacidity, as was shown by Bennett and Ryle.[15] In their series all cases of excessive salivation were excluded. In clinical work it is occasionally necessary to insist on expectoration of saliva or to make allowance for its occurrence in interpreting the curves. The proportion of cases in which it occurs has been small in my experience.

3. In man there is a certain amount of continuous secretion which can at all times be shown to be present excepting in cases of genuine achylia, but the importance of the psychic secretion is uncertain. Carlson [4] concludes that "the significant appetite secretion in man is that induced by tasting and chewing good food," and considers that Pavlov placed too great an emphasis on the secretion as induced in a hungry animal by seeing and smelling food. Haneborg [29] also doubts the importance of psychic secretion in man. Bennett and Venables [30] failed to demonstrate it in students, and in a few unpublished observations on myself I could not convince myself of its occurrence. I think, however, that the question is deserving of fuller inquiry. It cannot be denied that the insipid nature of the gruel, and the absence of any need for mastication, would tend to minimise appetite secretion (if it occurs), but this should be considered rather an advantage than otherwise, since it must render the conditions more comparable for different individuals.

4. That emotional inhibition of secretion may occur has been shown by various authors, including Hornburg,[31] in the case of the continued or appetite secretion in a child, and more recently by Bennett and Venables,[30] who greatly modified the acid curve with the standard meal and lengthened the emptying time of healthy individuals by suggesting nausea or anxiety to them while under the influence of hypnosis. Generally the emotional stresses of the test are not significant. The proportion of cases in which there is real difficulty in swallowing the tube or serious retching or nausea is small. Both with hospital and private patients the initiation and supervision of the test can safely be left to nurses who have had a little preliminary instruction and can appreciate the importance of making light of the difficulties. Among many hundreds of cases in the investigation of which I have been directly or indirectly concerned, I can call to mind less than half a dozen in which emotional factors prevented the swallowing and retention of the tube, and gross variations in the curves which could reasonably be attributed to mental or physical distress have been rare.

5. Just as salivation may alter the conformation of the curves of acidity by dilution and neutralisation, so, too, an abnormal amount of duodenal regurgitation consequent upon retching and recognisable by the presence of unusual quantities of bile may create a fallacy. Continued retching is even more rare in my experience than continued salivation. Nevertheless, admitting that there is often a disturbing psychic factor on the occasion of the first test, it is obvious that more reliable findings would be obtained by repetitions of the experiment. In clinical practice this is seldom feasible.

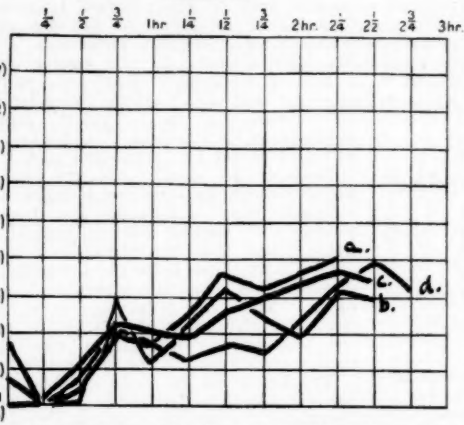
6. It is important to dispose of the criticism that there may be wide variations in the responses of the same individual from day to day. On the analogy of the variable tonic and peristaltic behaviour of the stomach secretory variations would also be anticipated, and such changing factors as appetite and hunger and minor differences in the conditions of the test might be expected to find reflection in the acid curves. We do not expect constant and identical behaviour on the part of other glands, such as the salivary and sweat glands, even under closely parallel conditions. With the fractional test-meal the conditions are, so far as possible, standardised by carrying out the test at the same time in the morning after the night's rest, by employing the same meal and the same method, and by encouraging the subject to occupy his or her mind with a book or other diversion during the period of the experiment. With these precautions the variation in the results obtained from the same individual on different dates have generally been slight. Where they appear more considerable the general conformation of the curve is maintained and the rate of emptying is remarkably constant. Subjects with low curves or achlorhydria show low curves or achlorhydria; subjects with high curves show high curves on subsequent occasions. The four curves here given were obtained in my own case on the dates indicated. (Chart 1.)

Bell and MacAdam [32] performed the interesting experiment of examining the same man on no less than 20 consecutive days. They found the rate of emptying remarkably constant. On 13 occasions it was one and a half hours. On five occasions it was one and three-quarter hours; on two occasions it was two hours. The general conformation of the curves was similar, but the curve obtained on the first day was distinctly lower than on any subsequent day.

7. Gorham [33] and Kopeloff [34] have criticised the fractional test-meal on the ground that acidities at different levels are sufficiently divergent to render the ordinary conclusions unreliable. It need hardly be pointed out that it is a part of the technique to keep the tube at the same level during the whole period of the test, and having regard for the fluidity of the gruel meal and the constant activity of the stomach during gastric digestion, it is difficult to believe that the contents can escape thorough mixing. On studying the reports of Gorham and Kopeloff, it appears that they did not employ the gruel meal. Kopeloff employed the tea and toast meal, and Gorham shredded wheat and water. With meals of this nature it is obvious that a certain amount of sedimentation will be liable to occur; that the farinaceous portions will be mixed with saliva; and that there will be greater variability in the fluidity of the samples. The experiments of Gorham and Kopeloff thus require repetition with the gruel meal. Even allowing that their criticism may be reasonable from the scientific standpoint, it need not necessarily be held to invalidate the practical utility of the test; Wheelon [35] supports Gorham's findings, but does not condemn the clinical employment of the test-meal. Fractional analysis is chiefly employed as a clinical test, and can never, by any stretch of imagination, be regarded

as an accurate chemical procedure. It must be clearly appreciated that its findings merely portray in a general way the results of the numerous processes influencing the chemistry of the gastric contents from moment to moment. A similar lack of appreciation of the objects and limitations of the test attach also to the contentions of Cole and Adie [36] and of Kopeloff,[34] who have urged the inadequacy of the usual titration methods and the importance of hydrogen ions and buffer salts in the estimation of gastric acidity. The time and attention expended

CHART 1.



Showing response of same individual on four different occasions. Standard gruel meal. (*a*) 18/1/20; (*b*) 25/1/20; (*c*) 1/2/20; (*d*) 9/5/20.

on such accurate methods would be out of all proportion to the results obtainable. Haneborg [29] states that the curve of hydrogen-ion concentration in fractional specimens follows the curve of free acidity fairly closely. Norgaard,[37] comparing pH estimations with titration results, concludes that "the titration method can therefore still be recommended as the most convenient and diagnostically adequate method of acid determination in test-meal investigations."

8. In regard to sex variations, Fowler and Zentmire,[38] examining the resting juice in healthy women, obtained results in all ways similar to those obtained in men by Fowler, Rehfuss, and Hawk.[39] I have not been able to find a reference to an extended series of test-meals in normal women. Kopeloff [34] examined ten young pupil nurses, each on several occasions. A study of the curves shows them to be mostly of normal type and conformation, but the acidities run at a slightly higher level in comparison with the chart obtained from the normal male series of Bennett and Ryle; this may be accounted for by the difference in the nature of the meal. Wright [40] investigated 250 school-children between the ages of 6 and 15 with the Ewald test and found the free and total acidity to give the same figures as in adults. He observed no essential difference between the sexes. Four cases of achlorhydria were encountered, but the finding was not constant in all four. Bell,[41] on an analysis of 425 test-meals in hospital and private patients, concluded that women preponderate over men in the low curves in the proportion of 68·4 to 42, and men over women in the high curves in the proportion of 100 to 61·2. It is improbable that pathological states would greatly influence the sex incidence of the different types of secretory response. A comparable, though wider, disproportion in regard to tonus in the two sexes in health has already been mentioned. It has been stated that there is a tendency to diminished secretion with advancing years. Haneborg [42] recently subscribed to this view, but Bell found no confirmation for this in the series just referred to. Actually he found hyperchlorhydria to be more common after than before 40, and a third of the instances of hyperchlorhydria after 40 were in men aged 60 and upwards.

In summary we may conclude that the practical utility of the fractional method as a means of studying gastric function has been sufficiently established; its value in clinical work is great, but it must not be regarded as a "diagnostic" test excepting in the presence of obstructive lesions.

The findings in regard to gastric secretion and motility and the factors bringing about neutralisation in the normal series of 100 healthy students examined by Bennett and Ryle may be summarised as follows:—

The Fasting Juice.

This varied from 10 to 150 c.cm. with an average of 54 c.cm. Bile was present in 40 per cent. of fasting specimens. The range of free acidity was from 0 to 60 (per cent. of decinormal soda), taking all the cases, and from 0 to 22 in the 80 cases providing the figures for the standard chart. (Chart 3.) In a series of individual examinations of my own gastric juice carried out over a period of 31 days the quantities varied from "a few c.cms." obtained with difficulty to "20 or 30 c.cm." obtained with ease. It should be stated that my curve of free acidity corresponds closely with the mean of the 80 per cent. of normal students. The free acidity of the specimens varied from 0 to 22 and the total acidity from 4 to 38 with a difference between free and total acidity ranging between 10 and 15. During a portion of this experiment I was on a diet as nearly as possible salt-free. Over this period the fasting specimen was scanty and obtained with difficulty, but the response to the standard test-meal was not influenced. Bile in the fasting juice was present or absent with equal frequency and sometimes absent in the first syringeful and present in the second, suggesting that either aspiration or automatic reflux from the duodenum had occurred.

Acidity.

The percentage of free acid in 91 of the cases showed a steady increase after ingestion of the meal, reaching a maximum at one and a quarter hours, and was thereafter followed by a gradual fall. The extreme variations in the curve of the acidity are shown in Chart 2. Chart 3 shows the variations in the 80 per cent. selected to compose the standard for comparison in clinical work. There is generally a difference between the curves of free and total acidity of 10 to 15 per cent. N/10 NaOH, and they run closely parallel. Four cases in the series—i.e., 4 per cent.—showed complete absence of free acid throughout the test on each of the several occasions on which they were examined. Confirmation of this finding was obtained by the alveolar CO_2 method of Dodds. Campbell [43] criticises this observation and suggests that the incidence of genuine achylia in health may be less than 4 per cent. and that if the total chlorides had been estimated in these cases it would possibly have been found that some of them were not cases of achylia, but of achlorhydria due to excessive neutralisation. In the series examined by himself in collaboration with Baird and Hern there were three case of achlorhydria, but only one of these was shown to have a constant achlorhydria and subsequent physicial studies raised doubts as to the fairness of classifying him as a healthy subject. Eight cases (Bennett and Ryle's series) showed hyperchlorhydria (acidity above 60 or 0·219 per cent. HCl) and of these five gave climbing types of curve akin to those encountered in pathological conditions such as duodenal ulcer. Six cases in the series showed a normal range of acidity, but unduly rapid emptying. *The important conclusion to be drawn from these observations is that neither hyperchlorhydria nor achlorhydria can in themselves be regarded as pathological findings.*

Bile Regurgitation and Secretion of Mucus.

Bennett and Ryle, and Baird, Campbell, and Hern refer in their two series to the frequent presence of bile in the fasting juice and also in the later specimens of the test-meal. Its appearance in the later specimens

often coincides with the commencement of the fall in acidity and probably accompanies the duodenal reflux which is considered to be an important factor preventing hyperacidity in the stomach. Baird, Campbell, and Hern found bile regurgitation to be rather more frequent in the cases with hyperchlorhydria. The amount of mucus present can only be judged visually. It becomes more plentiful towards the end of the meal, is sometimes mingled with a clear juice of low acidity, and probably represents the mucous portion of the protective alkaline secretion of the pyloric mucous membrane. There is generally an inverse relationship between mucus content and acidity.

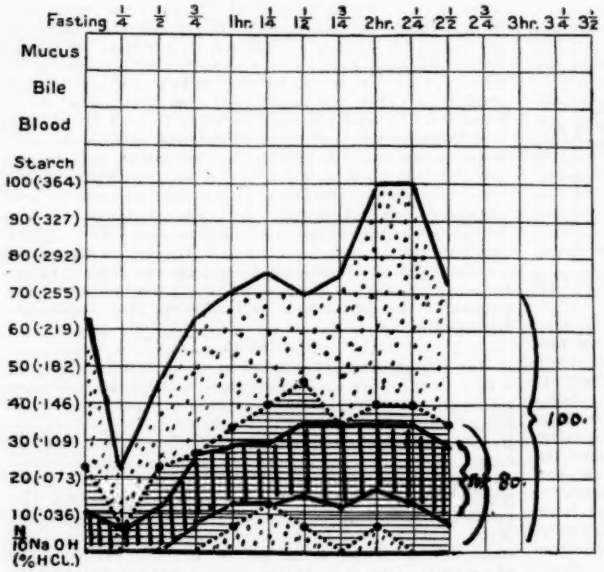
Rate of Emptying.

This has already been discussed under the heading of gastric motility. In Bennett and Ryle's series the average rate was 1·9 hours; in the combined series of Bennett and Ryle and Baird, Campbell, and Hern it was two hours. It appears to be very constant for the individual and shows a limited range of variability in the male community. Whereas the free acidity in healthy persons can vary from the mean by 300 per cent. and more, and tonus, if it were measurable, would probably be found to vary in at least an equal degree, the emptying rate varies by not more than 50 per cent. from the mean.

The findings of Campbell, Baird, and Hern [24 43] have frequently been quoted above. These observers repeated the experiments of Bennett and Ryle with a further series of healthy students, examining 57 men in all. They concluded as follows: "The general results of Bennett and Ryle on the rate of emptying the stomach and the range of acidity of the gastric juice after a gruel meal are confirmed in a further series of students," and "that the fractional test-meal does give a true idea of the course of digestion in the stomach, provided certain limitations about its accuracy are recognised." They also made interesting observations on the association of physical fitness with gastric type. In the normal and high normal groups they found that there is no association between the degree of acidity, the rate of emptying, and the physical fitness of the subject. Outside this range, however, hypochlorhydria or achlorhydria is more likely to occur in men leading a sedentary life and to be accompanied by rapid emptying; hyperchlorhydria to occur in men leading a more active life and more commonly to be associated with delayed emptying. The emptying-rate of the heavier barium meal showed an entirely different relationship, and, presumably by reason of its weight, was slower in association with hypotonus. Indeed, the weight of the barium constitutes a very real fallacy in radiographic estimations of motility.

A review of the results of Campbell and Conybeare, and Baird, Campbell, and Hern, in the light of clinical experience, seems to justify their conclusion "that certain anatomical and physiological variations present in health may be the physical basis of the subject's diathesis or tendency to develop certain gastric disorders under appropriate influences." Their findings thus lend support to the contentions of Hurst [44] in regard to gastric diatheses, provided we agree to accept "diathesis" as implying a tendency to "retain" or to "develop" and not a tendency to "acquire" a disease. We have, as Hurst has suggested and I shall endeavour to show, evidence that the physiological characters or habitus of the stomach may determine its dyspeptic reactions to various stimuli, and there is little doubt that the physiological characters may also help to determine the perpetuation of such a lesion as duodenal ulcer. There is, however, no evidence that the physiological characters render the stomach or duodenum more liable to acquire a lesion in the first instance.

CHART 2.



Showing variation of free acidity in a series of 100 healthy men. (Bennett and Ryle.)

Mention must be made of the indirect method described by Dodds,[46] who showed that there is a definite respiratory response to meals. Of this response the chief characters are an initial rise in the alveolar carbon-dioxide pressure of from 2 to 6 millimetres; later, after three-quarters of an hour, a fall of about the same amount below the original level; and finally a return to the original level. Bennett and Dodds,[46] comparing the results obtained by this method and by the fractional test-meal, found that they confirmed one another both in normal and abnormal groups of cases.

Response to Different Foods.

The response to different foodstuffs may, as I have shown elsewhere,[47] be readily studied by the fractional method. The accompanying charts (4, 5, 6, 7, 8, and 9) illustrate the response in my own case to meals of milk, skim-milk, an emulsion of cream, tea and milk, water, and a solution of sugar in water. The response to water, according to Ivy,[48] and also to Moffatt, Mitchell, and Powell,[49] is too variable for it to be employed as a test, and the long sojourn in the stomach of protein and fatty meals renders their use impracticable in routine work. The "exciting" influence of protein and the "inhibitory" effect of fats is demonstrated in the milk or skim milk and cream feeds respectively; the excitation and inhibition are as much in respect of motility as of secretion. The slowly climbing curve in the milk test-meal is closely similar to curves obtained with the gruel meal in pyloric stenosis; this similarity and the high point of acidity attained depend on delayed emptying rather than upon increased secretion. Skim-milk produces a curve similar to that obtained with gruel, except that there is a wider interval between free and total acidity owing to the combination of acid and protein. The cream, therefore, seems to be the factor responsible for the delay in the whole milk meal. The inhibitory effect of fats is probably due to their physical characters, and by imparting an insoluble pellicle to the mucosa they may be said to act in the same way as the excessive mucous secretion in gastritis which "blocks" the secretory and motor responses normally due

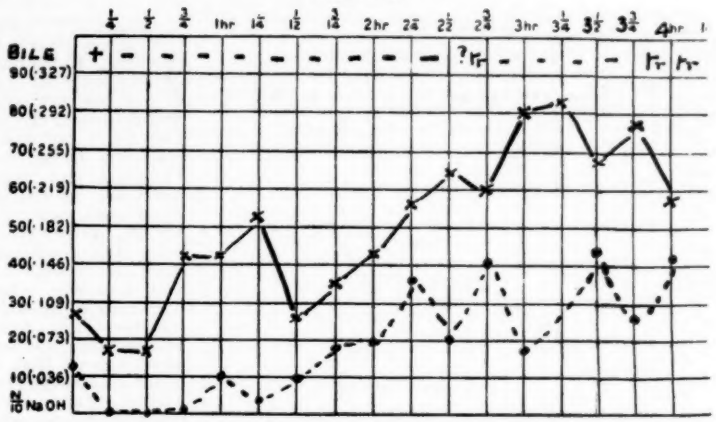
to the contact of soluble food with the mucous membrane.

Haneborg,[29] investigating the gastric response to supposed stimulants of appetite, concludes (as also did Carlson[4]) that bitters have no effect upon secretion; that coffee has a definite stimulant effect upon secretion; and that soup and extracts have a definite stimulant effect which is not due to their aromatic qualities, but, as with coffee, to certain xanthin bodies or purin bases. Pure albuminous substances such as egg-white produce no such effect. He claims that there are three classes of secretory response: (1) Psychic secretion (very insignificant in man); (2) secretion physically excited by water and all kinds of food; and (3) a chemical secretion excited by xanthin and caffeine on absorption, by the formation of a gastric secretin.

THE FUNCTIONS OF THE PYLORUS.

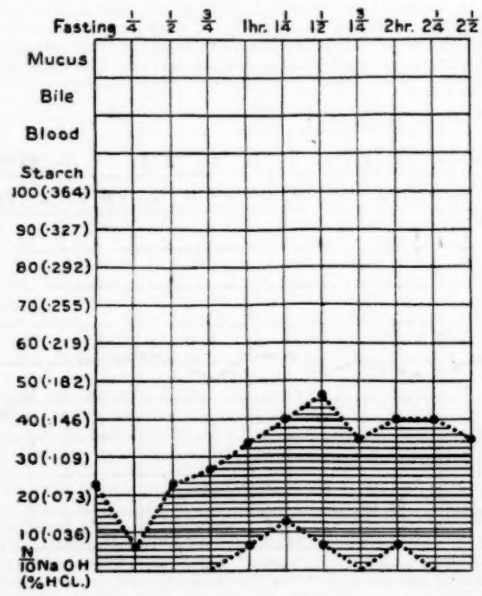
No discussion of gastric function would be complete without a reference to the modern views on the functions of the pylorus. An appreciation of its mechanisms in health is essential for a proper understanding of many of the symptoms of disease. Apart from controlling the exit of the stomach contents in such a manner as to prevent food entering the duodenum at too great a rate and in too indigestible a form the pylorus has been held to be the most important agent regulating the acidity of the gastric chyme. Boldyreff[50] was the first to draw attention to this particular function. Rehfuss and his collaborators[51] and Crohn[52] have regarded regurgitation from the duodenum as the main mechanism obviating hyperacidity, and Bennett and Ryle,[15] and Bolton and Goodhart[53] have subscribed to the same view.

CHART 4.



Milk test-meal (one pint). The straight line represents total acidity and the dotted line free HCl.

CHART 3.

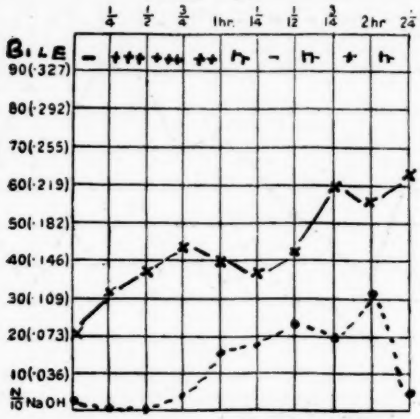


Standard chart (Bennett and Ryle). The shaded area represents the limits for free HCl of 80 per cent. of normal people.

Hunter[54] found marked hyperchlorhydria, with curves of the "climbing" or "plateau" type, in seven out of eight cases of gall-stones obstructing the common duct and attributed this to the absence of bile and pancreatic secretion. Other factors normally preventing hyperacidity include the diluting and neutralising effects of the saliva and the alkaline secretions of the pyloric mucosa. Campbell,[43] on the basis of a very ingenious experiment in which the factor of duodenal regurgitation was eliminated, considers that greater importance should be attached to the alkaline secretion of the pyloric part of the stomach. All of these factors naturally call for consideration in reviewing the mechanism of physiological and pathological hyperchlorhydria and hypochlorhydria. In an earlier paper[55] I concluded that the important factors promoting pathological hyperacidity were (1) an excess of secretion; (2) pyloric hypertonus preventing duodenal reflux. These I regarded as the essential factors in the ordinary case of a slowly emptying stomach, but with a rapidly emptying organ I suggested that the rapid emptying itself was an essential factor, since secretion (whether normal or excessive) into a steadily diminishing volume must entail a steady rise in the percentage acidity. Theoretically, it would only require a certain degree of gastric hypertonus to prevent duodenal reflux altogether; actually, of course, the tonus must vary from moment to moment, so that even with a hypertonic organ the intragastric pressure at times (though less frequently and less completely than with normal tonus) falls below the intraduodenal pressure. Apperly[56] subscribes to the view that increased intragastric tension is a cause of hyperchlorhydria and believes that positive forces in the duodenum normally play a part in the regulation of alkaline reflux. Important observations by Bolton and Goodhart,[53] and later by Campbell[43] and his collaborators on the estimation of chlorides in fractional specimens have thrown further light on the influence of duodenal regurgitation. These workers rightly point out that without chloride estimations it is impossible properly to interpret hyperchlorhydric and achlorhydric curves. When free acid is present in excess chloride estimations alone can distinguish between a positive hypersecretion and a failure in neutralisation. When free acid is absent chloride estimations alone can distinguish between achylia and achlorhydria due to excessive neutralisation.

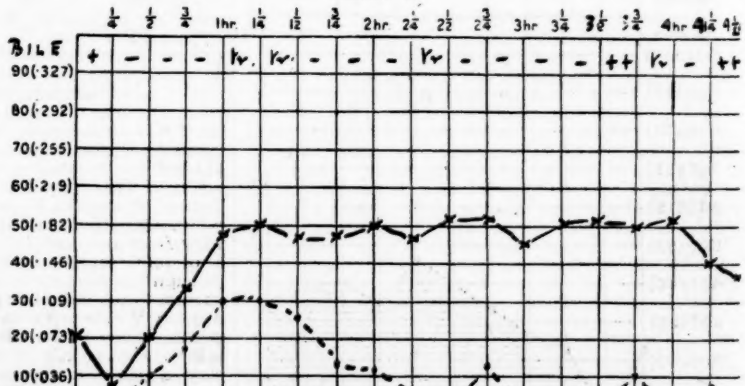
Bolton and Goodhart and Campbell conclude that the pylorus is the main factor controlling duodenal reflux. I believe, however, that a clearer conception is required of what we mean when we employ the term pylorus in this sense. It is evident that whatever part the opening and shutting of the sphincter may play in assisting or preventing alkaline reflux, there must also be a simultaneous adjustment of intragastric and intraduodenal pressure. The mere relaxation of the sphincter, for instance, would not allow regurgitation if the pressure in the pars pylorica did not at the same time fall below the pressure in the duodenum. The high position of the pars pylorica in relation to the duodenum in the hypertonic or "steer-horn" stomach is an additional factor opposing duodenal reflux, while its low position in the hypotonic or "J"-shaped stomach would facilitate reflux, at any rate in the erect posture. The pylorus consists of the pyloric sphincter and the valve formed with its covering fold of mucous membrane; anatomically the sphincter is a continuation of the præ-pyloric circular muscle layer and probably works in unison with it. On this hypothesis it is reasonable to suggest that *a general hypertonus of the whole pars pylorica by causing unusual disparity between intragastric and intraduodenal tension, and not a simple closure of the valve, is the essential factor predisposing to hyperchlorhydria.* Conversely, hypotonus of the pars pylorica as well as of the sphincter would predispose to hypochlorhydria. The pyloric antrum is of tubular form in the normal "hypertonic" stomach, and with duodenal ulcer (in which hyperchlorhydria is more constantly present than in any other condition) general hypertonus is commonly demonstrable. Eliminating the services of the sphincter in cases of duodenal ulcer by a gastro-jejunostomy does not necessarily abolish the hyperchlorhydria as it should do if the sphincter alone were to blame. Clinical observations to be discussed later suggest that acidity remains high after gastro-jejunostomy in the cases with hypertonus and rapid emptying, and that the most effective neutralisation occurs in the cases with hypotonus and slow emptying.

CHART 5.



Skim-milk test-meal (one pint). The straight line represents total acidity and the dotted line free HCl.

CHART 6.



Emulsion of cream and water (1½ oz. cream, 1 pint water). The straight line represents total acidity and the dotted line free HCl.

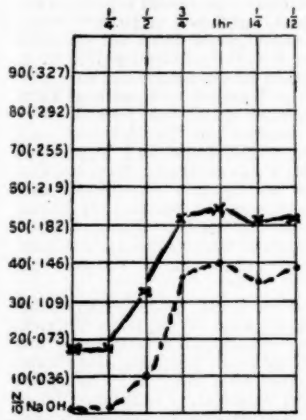
The Control of the Pylorus.

Cannon's [57] views on the acid control of the pylorus so long accepted have recently been called in question. McClure, Reynolds, and Schwartz,[58] on the basis of radiographic experiments, conclude that "acid is not the principal factor controlling the opening and closure of the pyloric sphincter in man." Egan,[59] also on X ray and experimental evidence, concludes that the usual view is unsatisfactory, and Baird, Campbell, and Hern,[43] with simultaneous gastric and duodenal intubation, showed that "acid in the duodenum does not necessarily close the pylorus, for the most rapid emptying took place at a time when the duodenal contents were unusually acid." The observation that extreme hyperchlorhydria and complete achylia may occur in healthy men with normal digestion and in patients without gastro-intestinal symptoms, and that there is no fixed relationship between acidity and emptying-time also suggests that the acid factor in pyloric control is not an essential one. Where a relationship between a secretory anomaly and emptying-rate is demonstrable it is just as reasonable to regard the high or low acidity as the result and not the cause of the pyloric hypertonus or hypotonus. Two clinical observations, however, require further consideration. The first is the relief of pain in duodenal ulcer by the administration of alkalies. Hurst [3 60] has regarded this as due in part to the lessened acid control of the pylorus; but I shall later suggest a slightly different explanation. The second is the immediate relief by the administration of hydrochloric acid of the gastrogenous diarrhœa accompanying achylia. In this condition the necessary dosage of acid is so small (30 minims three times a day of the dilute Pharmacopœial solution is usually enough) and the effect is so prompt that it is difficult to suppose that enhanced digestive or bactericidal action can be the relieving factor. This effect may be due to increased pyloric tonus, but another possible explanation is an increased output of pancreatic secretin and enhanced digestion in the small bowel.

Carlson [61] has recently shown in animals that not only acid but mechanical and even alkaline stimulation of the duodenum can produce pyloric closure, and considers that this is the result of simple sensory stimulation. Recent investigations thus tend more

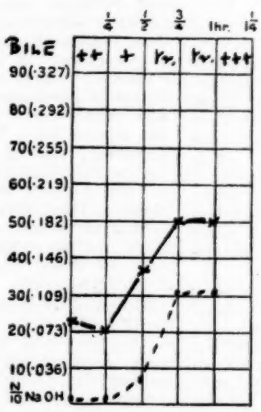
and more to bring the emptying of the stomach into line with the other peristaltic phenomena of the alimentary tract, stimulation at any point producing contraction or increased tension above and relaxation below, in accordance with the observations of Bayliss and Starling [62] on the movements of the intestine. Every tonic phase of the pylorus and the pars pylorica must, however, be followed by a phase of relaxation which, in the later phases of a meal especially, allows fluid regurgitation into the stomach and a lowering of gastric acidity. Probably a rise in intra-duodenal tension synchronises with the fall in intra-gastric tension. Although both in life and after death the aperture of the pyloric valve is a image a normal or exaggerated tonic contraction of the whole of the pars pylorica of the stomach.

CHART 7.



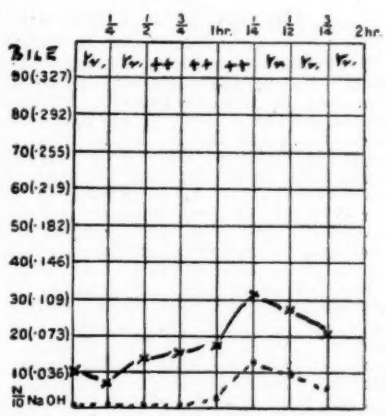
Tea and milk (half pint). The straight line represents total acidity and the dotted line free HCl.

CHART 8.



Water (half pint). The straight line represents total acidity and the dotted line free HCl.

CHART 9.



Sugar and water (half pint). The straight line represents total acidity and the dotted line free HCl.

very narrow one, it is doubtful whether in health it can ever be regarded as completely shut. Screening and radiograms after a barium meal suggest (even in conditions such as duodenal ulcer, which are supposed to be associated with pylorospasm) that closure can never be more than a momentary affair, for direct continuity between the gastric and duodenal shadows is so commonly visible. It is obvious that the pyloric sphincter is able to resist the passage of large fragments and semi-solid chyme, but it would also seem that it allows a more or less continuous tidal interchange of fluid contents regulated by the varying pressures within the pars pylorica and the duodenum. That such an interchange is taking place is strongly suggested by inspections of the specimens obtained by the fractional method, whether during digestion or in interprandial periods. These may reveal bile or no bile at such comparatively short intervals of time (sometimes in one half of a specimen and not in the other) that the impression is obtained of a "to-and-fro" mechanism of this kind. Without such a "to-and-fro" mechanism neutralisation could hardly be such a regular process as it is shown to be. The fact that bile becomes plentiful towards the end of a meal when the stomach is adapting itself to its diminished content and tonus is presumably increasing necessitates the conception that even at this stage the intra-gastric tension must automatically and frequently fall below the intra-duodenal tension.

I think we may fairly conclude that a reciprocal action as between the tonus of the pars pylorica and the duodenum plays a more important part in regulating (1) fluid outflow and (2) gastric acidity than the opening and shutting of the pyloric valve, and that when we speak in a general way of closure of the pylorus and in pathological conditions of "pylorospasm" we should include in our mental described. The emptying-rate for the individual with a standard test-meal shows considerable constancy, and whether in the individual or the community is a less variable quantity than acidity or tonus.

4. The variations in tonus and peristaltic activity are as wide as the variations in appetite and hunger. Extraordinary variations in acidity also occur, from complete "achlorhydria" to extreme "hyperchlorhydria," and are generally expressions of the variations in tonus, peristalsis, and motility. An appreciation of the existence of such variability in health is essential for the study of the gastric responses to disease.

5. Evidence for a correlation between physical type or habitus on the one hand and motor and secretory type on the other has been cited. A familiarity with the characters of the extreme physiological types is essential for the study of certain pathological types. In these characters may originate the liability to certain dyspeptic reactions, and possibly also the "diathesis" or liability to "retain" or to "develop" certain types of local disease.

6. Recent views on the functions and control of the pylorus have been discussed.

SUMMARY.

1. The present position of our knowledge relating to normal gastric sensibility, motility, and secretion in man has been reviewed.

2. Evidence has been adduced to show that the motor or muscular functions of the stomach play a far more important part in controlling both sensibility and digestion than do the secretory functions.

3. The "clinical," radiographic, and chemical criteria of healthy motor function have been briefly

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(*Continued at foot of next page.*)

Milroy Lectures

ON

EPIDEMIC DISEASES OF THE CENTRAL NERVOUS SYSTEM.

Delivered before the Royal College of Physicians of London on March 5th, 10th, and 12th, 1925,

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LECTURE III.*—THE EPIDEMIOLOGY OF ENCEPHALITIS LETHARGICA.

HISTORY OF THE DISEASE.

IT is possible, and even by some considered more than probable, that outbreaks of encephalitis lethargica occurred prior to 1916-17. Crookshank [1] gives an account of epidemics in the past which may have been examples of the disease, and Hall [2] has assembled interesting clinical evidence on the subject. It is indisputable, however, that the authentic study of the malady began in the winter of 1916-17 when von Economo [3] and von Wiesner [4] in Vienna described the clinical and pathological features of 13 cases presenting the cardinal phenomena of stupor, accompanied by disturbances of the ocular muscles.

Encephalitis lethargica next made its appearance in France, where the outbreak was studied by Netter.[5] In March and April, 1918, a number of cases of an obscure disease, characterised usually by stupor or lethargy and ophthalmoplegia, were reported in England. Early attention was directed to the subject by Harris [6] and by Hall.[7] A likeness to the clinical description of botulism was observed in these cases, and the suggestion hazarded that they were due to the consumption of food infected with the *Bacillus botulinus*. A detailed investigation was made under the auspices of the Local Government Board and the Medical Research Council which put botulism out of court as responsible for the outbreak. It should be remarked that owing to the war we were ignorant of von Economo's work, and that the disease was investigated *de novo* in this country.

The outbreak was studied from the pathological aspect by McIntosh and Marinesco, from the epidemiological standpoint by James, and by myself from the clinical point of view.[8] We arrived independently at the same conclusion that the "new disease" was anatomically and clinically distinct from analogous affections such as the cerebral form of poliomyelitis (polioencephalitis), and constituted a clinical entity. Kinnier Wilson [9] and Buzzard [10] also early adduced evidence supporting the same conclusion. Later, we were in a position to add that the illness as it appeared in the outbreak was identical with encephalitis lethargica, described by von Economo and by Netter. Our findings were recorded in a special report to the Local Government Board, published in 1918.[8] Since then information has been given from all quarters of the globe. A comprehensive report by Dr. A. C. Parsons,[11] which embodied much additional information, was published by the Ministry of Health in 1922. The more recent researches upon the pathology of the disease have been carried out by McIntosh and Turnbull, Greenfield and Da Fano and Ingleby in this country, in France by Levaditi and Harvier, and in the United States by Loewe, Hirschfeld and Strauss, Thalhimer and Amoss.[12] Buzzard, Hall, and Netter have continued to enrich our clinical knowledge, and in epidemiological investigations mention must be made especially of the work of Parsons and of Stallybrass.[13]

Encephalitis Lethargica in Great Britain.—The outbreak in 1918 affected in all some 51 sanitary districts in England and Wales. Encephalitis lethargica was made compulsorily notifiable in England and Wales on Jan. 1st, 1919, and from that date fairly complete records of all recognised cases are available. There was a recrudescence of the disease in the early part of 1919 when the notifications reached a maximum figure of 41 in the week ending Feb. 8th. Since then annual returns have shown that it has a tendency to recur in epidemic form in the early months of the year. Previously to 1924, the most considerable outbreak occurred in the spring of 1921, when a maximum of 138 notifications was reached in the week ending

* Lectures I. and II. appeared in THE LANCET of March 7th and 14th respectively.

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Jan. 5th. In inter-epidemic periods the notifications have averaged about 10 per week. The outbreak in 1924 began in the latter part of January and was at first localised in Lancashire; it is noteworthy that the disease first appeared in outlying districts and only later converged on the larger centres of population. The peak of the epidemic in Lancashire was reached in the week ending March 8th, when a total of 78 cases was notified, 29 of which were in Manchester. Liverpool was affected somewhat later. From Lancashire the stress of the epidemic passed eastward to Yorkshire, and at the same time the disease began to manifest itself in Northumberland, Warwick (with special incidence on Birmingham), Gloucester (where Bristol was specially attacked), and London. The chief centres of infection were Manchester, Sheffield, Birmingham, and Bristol. Elsewhere the disease has been widely scattered and sporadic in appearance. For the first 20 weeks of 1924, 2469 cases were notified, as compared with 1155 in the corresponding period of 1921.†

The number of cases notified in 1924 up to Oct. 25th was 4605; already by this date the number of cases of the disease in 1924 had exceeded the figures for each preceding year of notification.†

Scotland.—Encephalitis lethargica is not generally notifiable in Scotland except in certain districts locally under the Infectious Disease (Notification) Act, 1889. The annual reports of the Scottish Board of Health indicate that the disease did not manifest itself in pronounced epidemic form in Scotland until 1923, when cases were reported by medical officers of health of widely different areas, both populous industrial districts and rural areas, such as Easter Ross and Aberdeenshire. There was an intensive outbreak in Glasgow in this year, comprehending 125 cases out of the 189 cases in Scotland coming to the notice of the Central Health Authority. Chalmers and Macgregor[14 15] have reported fully on it. From the Registrar's returns it appears that in 1923, 79 deaths from the disease took place in the 16 larger towns of Scotland.

Ireland.—Encephalitis lethargica does not seem to have been unduly prevalent in Ireland, although since 1919 a certain number of cases have been reported annually from different parts. Lumsden,[16] writing in 1920, had then observed some 20 or 30 cases in Dublin.

Geographical Distribution.

It is probable that instances of encephalitis lethargica occurred immediately prior to the Austrian outbreak. Examples were reported in France during the winters of 1915–16 and 1916–17 in the districts around Commercy, Verdun, and Bar-le-Duc, and came under Cruchet's[17] observation in various military neurological clinics. In Austria cases were seen in the later months of 1916 and the first quarter of 1917. The outbreak subsided. In the first quarter of 1918 the disease appeared simultaneously in England and France, in Algiers, where it was probably conveyed by French troops, and in Germany in Berlin. The outbreak appears to have been restricted to the countries named. In September and October, 1918, encephalitis lethargica appeared in the United States, and cases occurred in New York, Chicago, and elsewhere.

In the first quarter of 1919 the disease was again prevalent in England and France; it also was manifest in the Netherlands, Germany, Warsaw, Italy, Sweden, and parts of Russia (Ukraine). Isolated cases were noted at Geneva and Neuchatel in the early part of the year; later the disease prevailed in Switzerland, and examples were reported so far afield as the Philippines, Guatemala, &c. In the last quarter of 1919 it had spread to Canada (where an outbreak was recorded at Winnipeg by Boyd[18]), Italy, and India. During the winter of 1919–20 there was a sudden and severe outburst of the disease in Northern Italy, Austria, Bohemia, and Bavaria were also smitten. The disease continued to occur in Germany, Belgium, and Holland, and became established in Spain and Portugal. In 1920 the Scandinavian countries were invaded. Sweden, Norway, Denmark, and Finland were appreciably affected. Cases were also reported from Bagdad, Palestine, Egypt, and China. In December, 1921, there was an outbreak of the disease in Berlin; in France the epidemic was severe. Encephalitis lethargica has appeared in Luxemburg, Roumania, Czecho-Slovakia, Malta, and Syria; cases are accumulating in the Orange River Colony and South Africa generally and have also been reported from Swaziland and the Gold Coast. Australia, New Zealand, and Tasmania are not exempt. In the New World epidemic encephalitis now occurs annually in Canada and the United States; it has appeared in some of the larger cities of Mexico, Brazil, and Chile. In 1924 a severe outbreak of an epidemic cerebral disease apparently resembling encephalitis lethargica was reported from Japan. Exercising its severest stress in Europe, its apparent birthplace, within seven years encephalitis lethargica has become widespread in every continent.

Incidence.

The number of cases notified in England and Wales annually since 1919 are given in Table I. (Lecture I.). It is probable that this under-rates the extent of the disease as many mild and abortive cases, including cases of epidemic hiccup, fail to be notified. The general attack-rate in 1920 in England and Wales was estimated at 0·02 per 1000 of the population. For London the general attack-rate was taken as 0·03 per 1000 of the population. There is not always a strict correlation between population and case-incidence in encephalitis lethargica. Bristol's aggregate of 108 cases during the period from Jan. 1st, 1919, to Sept. 30th, 1921, was nearly double that of Birmingham, although its population is scarcely half that of the Midland town. The incidence of the disease in this country shows a perceptible increase, considerably marked in 1924.

Incidence in Urban and Rural Communities.—Encephalitis lethargica has been reported chiefly from urban districts, which in 1920 supplied 86·8 per cent. of the total number of cases notified. Large cities and industrial centres have been particularly affected, probably on account of the enhanced opportunities for the spread of personal infection, although possibly the better facilities for medical diagnosis possessed by large towns may also contribute. During the three years, 1919, 1920, and 1921, examples were notified from 520 (45·7 per cent.) of the 1138 urban and from 254 (39·0 per cent.) of the 650 rural districts in England and Wales. In 1918 I found a restricted topographical distribution of cases of encephalitis lethargica in certain districts, notably in Stoke-upon-Trent. The same tendency for examples of the disease to clump in certain areas of a town or city was noted in 1924 in Sheffield and elsewhere, probably associated with density of population and increased opportunities for case-to-case infection.

Mortality.

In 1918, in the first outbreak in this country, out of 168 cases of the disease 37 died, a case-mortality of 22·0 per cent. Variant case-mortality rates are quoted by Parsons[11] ranging from 53·0 per cent. (McClure) to 15·7 per cent. (Bramwell). The notification figures (England and Wales) for 1919–23 gave a case-mortality rate of 54·0 per cent. In view of the failure to notify cases of epidemic nervous disease generally, and through failure to recognise mild non-fatal types of encephalitis lethargica, these figures cannot be taken as a true estimate of the number of deaths that occur among persons attacked by encephalitis lethargica. No definite opinion can be expressed at present as to the case-mortality, except that it is probably under 50 per cent.

Age, Sex, and Race.

All ages may be attacked from the newborn babe to the octogenarian. A woman of 84 has died from

† These are only provisional figures; the complete returns for 1924 are not yet available.

the disease. The main incidence of the disease begins to be apparent in those approaching adult life; 25 per cent. of a series of British cases occurred in persons between the ages of 10 and 20 years. The incidence appears to be fairly evenly distributed over the years 20 to 40, but the tendency to acquire encephalitis lethargica declines with advancing age.

Sex.—The records of the Ministry of Health show that the sexes are equally affected. Of 1273 cases, 634 were males and 639 females. This proportion is evenly maintained at different age-periods.

Race.—With few exceptions no special racial incidence has been observed. In Warsaw the case-incidence in the Jewish population was high. Butt reports that the mortality among South African natives was exceptionally higher than that of the whites.

Seasonal Prevalence.

The first outbreak occurred during the first quarter of 1918. James early called attention to the difference between the seasonal incidence of the disease and that of poliomyelitis. Since then the increase in the number of cases in the colder months of the year has been annually noted in this country, the rest of Europe, and in North America. The increase in the incidence of encephalitis lethargica usually begins towards the end of December and continues during the first quarter of the new year. The second quarter shows still many cases, but by the end of May the epidemic has waned and much fewer cases, as a rule, are notified in the third and fourth quarters of the year.

The seasonal incidence in England in 1920 was exceptional in that there was a recrudescence in May, June, and July which reached its climax about midsummer. The cause of this is not clear, but the month of July that year was abnormally wet and cold. Small localised outbreaks have occurred in non-epidemic months, for example, the Derby outbreak in a girls' home in August, 1919.

Predisposing Causes.

Careful inquiries have been made by the Ministry of Health into possible predisposing causes but little of value has resulted from the quest. The influence of pregnancy is regarded as of importance by some writers. Jorge, in reviewing a series of 18 pregnant cases, found that the mortality-rate was 72 per cent. On the other hand, the Ministry's figures show that the mortality-rate in respect of all the cases of encephalitis lethargica which were associated with a pregnancy past or present is 44 per cent.; this percentage also represents the general case mortality among all women between the ages of 20 and 40 who contracted the disease during 1919 and 1920. Social conditions appear to exert no influence upon the disease. As regards occupation, from a study of 1070 patients, Parsons[11] found that 734 followed indoor occupations, 133 engaged in outdoor occupations, while 203 patients belonged to an indeterminate group. He concludes that the disease chiefly attacks those who spend the greater part of the day indoors in pursuit of their avocations. Over-work is often assigned as a predisposing cause. The specific infectious diseases and diseases generally do not appear to dispose to the disease beyond the circumstance that any antecedent or associated disease may lower the patient's resisting powers to infection.

The Question of Reinfection.

It is impossible at present to say whether the disease may occur more than once in the same individual. Netter[19] reports the case of a child, aged 9 years, who became the subject of encephalitis lethargica in December, 1920. The child had been in contact with a person who had suffered from encephalitis lethargica eight months previously, had apparently recovered, and then manifested symptoms of the disease again shortly before the child was attacked. G. E. Price[20] records a case in a girl of 12 years in whom there was one and a half years of apparently complete recovery; then a recurrence ending fatally took place. Buzzard[21] has seen a case of encephalitis lethargica in an elderly woman who similarly made an apparently complete recovery; four years later, in 1924, at the height of the epidemic period, she again displayed symptoms of encephalitis lethargica and died. In view of the epidemicity prevailing at the time of the second manifestation, Buzzard's case may have been one of reinfection. On the other hand, the frequent occurrence of sequelæ, mental changes, symptomatic paralysis agitans and the like, may be due to persistence of the virus of the disease which, like the virus of syphilis, may be capable of lurking quiescent in the body for long periods and of returning to activity from time to time. Hall[2] states there is no a priori reason why the virus should not so persist for any period, indeed for the remainder of life. Nonne[22] believes that there may be a "normal" interval of three to four years between the acute and chronic stages of the disease. The lapse of time alone can solve the problem. Alarming from the epidemiological standpoint is the view that the virus so persisting may for an indefinite time be capable of transmission to others under fostering conditions. Netter[23] and others have adduced a certain amount of evidence in support of this contention.

Route of Infection.

Like cerebro-spinal fever and acute poliomyelitis, it seems reasonable to conclude that the virus of encephalitis lethargica first infects the upper respiratory passages, where it may either lurk and give rise to the carrier phase in the person infected or may pass on to attack the brain. There is no definite catarrhal stage associated with its early manifestations, but sore-throat is a frequent concomitant. Dr. Willoughby Gardner[11] has described its peculiar characteristics thus: "There is slight swelling but very marked congestion of the fauces and pharynx; the colour is generally a deep crimson, but sometimes is almost vermilion. There is comparatively little swelling of the tonsils, but whitish patches of exudation are to be seen on tonsils, fauces and pharynx.... These throats tend soon to become dry, and are often associated with a red, bare, swollen, and dryish tongue." Similar attacks of "sore-throat" are seen in the associated abortive and mild cases. I was especially struck by this in the mild cases in the Derby outbreak. There is reason also to believe that the virus may enter the brain through the eyes. I early drew attention to the frequent presence of conjunctivitis in the first stages of encephalitis lethargica.[8] Levaditi, Harvier, and Nicolau's[24] experimental method of transmitting the virus of encephalitis lethargica in series in rabbits by corneal inoculations is of interest in this connexion.

Lastly, infection by the gastro-intestinal route cannot be dismissed. Many cases of illness in the 1924 epidemic associated with undoubted cases of encephalitis lethargica exhibited vomiting and diarrhœa. Exactly as in poliomyelitis, a gastro-intestinal type is recognised in the mild and abortive forms of encephalitis. Gastro-intestinal symptoms occur occasionally in the disease, and in autopsies on patients in 1924 presenting these features ulcers were observed in the intestine together with softening and slight enlargement of the spleen. In 1918 in the first post-mortem I performed on a case of encephalitis lethargica this splenic condition was noted.

Incubation Period.

No definite statement can be made as to the incubation period. It is probably variable like that of acute poliomyelitis. Reece's[25] case of a nurse infected by a patient would assign the incubation period as nine days. In the fulminating outbreak at Derby the incubation period may have been of short duration. Our records at the Ministry of Health suggest that it may very widely from one to two days up to two weeks or more. Kling and Liljenquist[26] found the period could be determined in three of their cases and regard it as being ten days. Five

days is the duration of incubation, according to Godfrey and Gwyn.[27] For the isolation of persons who have been in intimate contact with the disease three weeks is usually regarded as sufficient. Most recorded cases assigned to direct contagion have developed the disease within this period.

Epidemic Hiccup.

Von Economo [3] recorded hiccup as a complication of encephalitis lethargica in one of his original fatal cases in 1917, and I noted it in five of my series of cases in 1918.[8] In the autumn of 1919 small outbreaks of illness occurred in Egypt, Austria, Italy, Germany, and Canada in which hiccup, sometimes associated with fever, was the predominant symptom. In 1920-21 it was particularly prevalent in France. Railliet [28] saw 130 examples at Rheims in November and December, 1920. At the same time epidemic hiccup appeared in this country and was investigated by Farrar and myself on behalf of the Ministry of Health.[11] It is contagious—the casualty medical officer of Charing Cross Hospital apparently contracted it from his patients—though not in a high degree. In the first quarter of 1924 epidemic hiccup was widespread. It was seen in definite association, for instance, in the same household, with encephalitis lethargica; an attack of hiccup may precede or accompany the nervous symptoms of the major disease and there is strong reason, in view of the cumulative evidence, for regarding epidemic hiccup as a mild or frustrated form of encephalitis lethargica.

PREVENTION OF EPIDEMIC DISEASES OF THE CENTRAL NERVOUS SYSTEM.

The first step in prevention of disease is to survey the magnitude of the problem. It has been shown in these lectures how defective is notification of epidemic diseases of the central nervous system, and it is incumbent upon both medical officers of health and practitioners of medicine to aim at improvement in this respect, and, particularly in epidemic periods, to keep an alert watch for abortive and mild types of nervous disease.

Health authorities in epidemic periods should endeavour to inform the public, by means of leaflets, posters, notices in the press, cinema films (preferably shown in the open), lectures in the school, &c., how infection may be guarded against and the care to be observed in case of attack. Public information should be circulated also respecting the local facilities for treating patients which have been provided in the district. When epidemics prevail, all crowded assemblies should be discouraged, as far as is possible, and all gatherings of young children must be avoided; young children must not be allowed to enter any house where there is a case of illness. The latter precautions are of especial importance in outbreaks of poliomyelitis.

In view of the severity of epidemic nervous diseases and the value of good nursing for the patients, it is important to secure hospital treatment as far as possible. The isolation hospitals of local authorities are often available for this purpose. In addition, any public nursing arrangements possessed by or arranged with the authority should be made available for patients treated at home. In the case of patients so treated the sick should be isolated from the healthy, the association with other inmates of the household being limited to what is necessary for requisite care and nursing.

School-children in the affected household may be kept from school, as a precautionary measure, for three weeks after the isolation of the patient. There is no necessity to place restriction on the movements of other occupants provided they are frequently examined and remain well. Those in contact with the case, however, may be advised to use antiseptic nasal sprays or douches and to gargle the throat. Any person in the infected household who suffers from sore-throat or other symptoms suggesting an abortive attack should be treated from this point of view and isolated as far as possible until they have recovered. The sick-room should be thoroughly cleansed and disinfected at the end of the illness.

In only one of the three epidemic nervous diseases does the question of serum-therapy at present arise as a prophylactic measure. So far the experience with prophylactic injections of anti-meningococcic serum has not given such favourable results as to commend its general adoption in an epidemic period of cerebro-spinal fever.

GENERAL FEATURES OF EPIDEMIC DISEASES OF THE CENTRAL NERVOUS SYSTEM.

It is apparent from our study of the epidemiology that the three diseases, cerebro-spinal fever, acute poliomyelitis, and encephalitis lethargica, all possess points of similarity. So much is this the case that the clinician may find it hard to make a differential diagnosis; epidemics of cerebro-spinal meningitis have frequently been confounded in the past with those of acute poliomyelitis, and acute poliomyelitis, especially in outbreaks where cerebral types occur, has been mistaken for cerebro-spinal fever. Encephalitis lethargica when it first appeared, after the diagnosis of botulism had been excluded, was considered a cerebral form of poliomyelitis. Osler for a time held this view. The advocates of the epidemic constitution hypothesis would correlate all three epidemic diseases of the central nervous system as manifestations in the wake of influenza.

In these lectures the view has been adopted, from epidemiological, clinical, and pathological evidence, that each of the diseases considered is an independent entity. At the same time the resemblances indicate that they belong to the same epidemiological family tree, and repeated allusion has been made to the fact that the study of one disease may make clear the epidemic behaviour of the others. Elsewhere, I have compared the relation which subsists, for example, between acute poliomyelitis and encephalitis lethargica to that between typhoid and paratyphoid fevers.

GENERAL BEHAVIOUR OF EPIDEMICS OF THE CENTRAL NERVOUS SYSTEM.

It has been mentioned that cerebro-spinal fever occurs in epidemic periods or cycles, and suggested that acute poliomyelitis and encephalitis lethargica also obey an epidemic law of this character. The organisms of epidemic nervous disease are always present in countries which have been affected by previous outbreaks of these diseases. This is shown by the presence of sporadic cases as well as by bacteriological evidence which indicates that persons may harbour the meningococcus or the virus of poliomyelitis in non-epidemic periods without displaying symptoms of illness. By these means the strains of the causal organisms are kept in circulation through a community. Consideration has also been paid to the question of evolution of these organisms which, previously mere saprophytes, may to-day have assumed inimical parasitical characteristics. It has further been contended that the central nervous system of man to-day is more subjected to fatigue and strain than in more leisured centuries, and that the organisms have attacked him in a region where his systemic defences are weakest.

It is at this stage that some factors as yet unknown come into play and initiate an epidemic of nervous disease. The virus of the disease is exalted, possibly by increasingly frequent passage through susceptible individuals; the increasing number of cases in successive years which portend an epidemic is in favour of this contention possibly by cosmic influences, such as unusual variations in seasonal temperature, excessive warm weather, and the like; probably other factors appear simultaneously, which lower the defensive forces of the human organism, and to these may be added increased opportunities for personal infection to the influence of which the movements and aggregation of troops in the last war supply ample testimony.

Infection in a nervous epidemic is disseminated, in the first place, like other infectious diseases, by case-to-case contact. If this method of propagation always succeeded, epidemics of nervous disease would be the deadliest of all scourges of mankind. Personal contact does not play the major rôle in the epidemic spread, although, in my own view, its influence is greater than that commonly assigned to it.

The links in the chain of infection are broken, first, by the fact that the causal organisms die out quickly and have a brief existence outside the body; second, because many persons infected do not contract the disease owing to lack of that mysterious catalytic agent of infection which is termed susceptibility. While these epidemiological characters stand to the credit account of epidemic nervous diseases, others must be debited which are important and serious, and make the problem of prevention extremely complex and baffling.

It may be assumed that in epidemic periods the viruses of these diseases are widespread among the population of the area affected. The thesis, as we have seen, is proven for cerebro-spinal fever and acute poliomyelitis. The epidemiological behaviour of encephalitis lethargica bears so great a resemblance to these diseases that the assumption appears equally true for it also, although at present bacteriological proof cannot be adduced. There is reason for postulating that any one of the "carriers" may transmit epidemic nervous disease to others, or may more rarely themselves develop a declared type of nervous illness. In these diseases there is as yet no method of animal experiment, as in the case of diphtheria, for deciding whether the "carrier" harbours a benign or virulent form of organism. Furthermore, all three forms resemble one another in that they give rise to mild and abortive types which often pass unrecognised and which have all the potentialities of disseminating the epidemics in their gravest form. I would submit that it is these circumstances which underlie the widespread distribution of an epidemic and its apparent sporadicity. It has been noted by Wickman and others that when an epidemic of nervous disease is localised and restricted to a particular town or small district the channels of direct and indirect infection from individual to individual can be traced with almost mathematical exactitude.

A last common characteristic of epidemic nervous diseases, and the most encouraging one yet cited, is that they conform to the behaviour of other epidemics in waning as well as waxing; they are all much influenced in this respect by seasonal variations.

EPIDEMIOLOGICAL DIFFERENCES BETWEEN EPIDEMIC DISEASES OF THE CENTRAL NERVOUS SYSTEM.

We have arrived at the conclusion that all three epidemic nervous diseases here considered resemble one another in epidemic behaviour in certain general features. It is equally well established that they possess distinct and independent epidemiological characters. The most important points of difference are seen in age-incidence, mortality, and seasonal incidence.

Table V. illustrates the differences in age-incidence shown by the three diseases. The greatest incidence of cerebro-spinal fever is at the 5–10 years age-period, that of acute poliomyelitis under 5 years of age, and that of encephalitis lethargica at the middle period of life.

Concerning mortality in both sexes, the fatality per cent. for epidemic nervous diseases in England and Wales for the year 1919 was found to be as follows in each disease: cerebro-spinal fever, 67·2 per cent.; acute poliomyelitis, 14·7 per cent.; encephalitis lethargica, 54·6 per cent.

As regards seasonal incidence for the year 1919, the highest point occurs for cerebro-spinal fever in May, for acute poliomyelitis in September, and for encephalitis lethargica in January. There are also many minor points of epidemiological differentiation which have been already set forth.

TABLE V.—*Showing for 1919 in England and Wales the Attacks by Cerebro-spinal Fever, Acute Poliomyelitis, and Encephalitis Lethargica at Different Age-periods as Percentages of Total Attacks at all Ages (Civil Population Only).*

Year 1919.	Both sexes.						
	Under 1.	1–	5–	10–	15–	20–	30 +
C.-S.F. ..	10·36	16·06	18·26	15·28	15·82	10·88	13·34
A.P. ..	6·49	46·01	25·04	11·13	6·12	3·34	1·87
E.L. ..	1·53	5·92	7·63	10·69	13·93	14·50	45·80

C.-S.F. = Cerebro-spinal fever. A.P. = Acute poliomyelitis. E.L. = Encephalitis lethargica.

CONCLUSION.

It sometimes falls to the lot of the epidemiologist to play the ungrateful part of Cassandra. In 1919, when writing of encephalitis lethargica, I drew attention to the infectivity and increasing number of cases of that disease and hazarded the opinion on the analogy of acute poliomyelitis that succeeding years might see a wider distribution of the disease in epidemic form. To my regret that prophecy has been fulfilled.

I am reluctant to seat myself again on the Delphic tripod, but the purpose of these lectures would be incomplete if attention were not again drawn specifically to the increase in epidemic nervous diseases, as displayed in recent years, an increase which the notification figures of England and Wales indicate but which must fall short of the true magnitude.

As regards cerebro-spinal fever, the notification figures since 1918 show a pleasing diminution; it is therefore to be hoped that we are now well towards the end of the epidemic period.

The prevalence of acute poliomyelitis continues and is an unwelcome portent. Still less reassuring is the increased epidemicity of encephalitis lethargica, and when thought is taken for the numerous mild and abortive forms and the many cases of epidemic hiccup which do not appear in the notification returns the increase becomes positively alarming.

It must be remembered that the mildest form of epidemic encephalitis may be followed by the most serious after-effects which cripple the individual concerned for life, either mentally or physically. The way in which epidemic nervous diseases are transmitted, above all the existence of the healthy carrier, makes, as has been shown, the application of the ordinary administrative measures employed for limiting epidemics of ordinary acute infectious disease to a large extent nugatory. Certain preventive measures that may be of service have already been considered.

At the same time the disciple of preventive medicine cannot stand aside, unfaithful to the high traditions of his calling, and watch the progress of epidemic nervous disease unmoved, until such time as the bacteriologist or biochemist supplies a serum or chemical compound to cope with the active virus. The one ray of light in this cloud of epidemicity is the fact that many persons are known to be insusceptible to infection. In the case of poliomyelitis Amoss and Taylor[29] have shown that certain bodies exist in the nasal secretions of certain individuals which are protective against the virus of that disease. If these protective substances are rarely found or are absent in young children the circumstance may account for the stress of the disease on the younger ages.

It may be suggested, therefore, that a closer study of the problem of susceptibility to infection may be an important means of acquiring success in coping with epidemic diseases of the central nervous system, and that the epidemiologist will do well to explore this avenue of research in the company of the clinician and the bacteriologist.

(*Continued at foot of opposite page.*)

LIME DERMATITIS.

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BOTH the mechanical and chemical sides of modern factory life are a fertile ground for new and increasing hazards to health. Old industries suddenly multiply or extend, alterations in factory processes bring in risks unrevealed by a consideration only of the chemical composition of the finished product. I wish here to show that a fuller consideration of the ill-effects of lime upon the skin is not only overdue, but that it affects a far wider industrial population than was envisaged by the leading dermatologists of the last generation.

Lime or cement is not mentioned in the index of the late Sir Malcolm Morris's text-book,[1] although in the chapter on eczema he states, "that it is by no means uncommon to see artificial dermatitis on a bricklayer's hands, followed by the development of true eczema on parts of the skin that have never been in contact with lime."

No paper on lime dermatitis has appeared in the *British Journal of Dermatology*. Prosser White[2] mentions that lime holes are found in the hands of pullers who scrape off hair from lime-soaked skins. Plasterers, masons, whitewashers, bricklayers, and cement-workers suffer, he says, from an eruption caused by splashes when slaking lime, in mixing Roman cement, and from the presence of lime dust,[3] and he pictures the deformed nails of a plasterer. Nevertheless, there is need of an authoritative record of observed cases first to establish the modern frequency and severity of lime dermatitis, and second, for reference by any medical practitioner who may be subpœnaed to give evidence in such cases under the Workmen's Compensation Acts. The need for work along this line is stressed by Dr. Macleod in his text-book of 1920.[4]

There are underlying group resemblances between cases of industrial dermatitis of diverse origin, but when the stage has been reached when the dermatitis of a chrysanthemum grower can be distinguished at sight from that of a hop-picker, and that of an arsenic-worker from that of a pitch-breaker, it will be conceded that a close study of case-records is essential if diagnosis is to progress beyond the recognition of the action of an undefined external skin irritant. In analysing these cases the patients themselves can often give little help owing to a congenital obtuseness or to the fact that the accepted title of their calling may be actually misleading.

Industrial Expansion of the Lime Industry.

Scattered through the chalk hills of Kent are many lime-kilns of real antiquity. One well known to me near Molash, Ashford, has not had its fire extinguished for certainly 100 years. Lime made in this traditional method has its own peculiar dangers. Tramps know the lethal end that awaits those who lie down for warmth on the earth beside the glowing tops of the kilns that are sunk into the soil in the form of narrow brick-lined cones. Farm labourers and fruit-growers are acquainted with the burns experienced when lime-washing their fruit trees. Leather gloves are habitually worn for this work on the great fruit farms about Swanley, Kent, but these men, as did the miner (Case 4), complain of great soreness of the skin on washing after the day's work is over.

The invention of *cement* by Aspdin in 1824 and the invention of mechanical means of manufacturing cement have enormously widened the field of possible human contact with lime or lime products.

A comparison between the first illustration of a wind-driven cement-mill on the river Medway with the photograph of the Associated Portland Cement Manufacturers' modern plant at Burham, Kent (Figs. 1 and 2), will drive home how great is the expansion that has occurred in the use of lime since a cement-making process was patented. Such factories are to be found in many places. The Associated Portland Cement Manufacturers have most kindly informed me that the annual output of Portland cement is probably about *three million tons*, and that of lime of all grades less than 500,000 tons.[5] Five thousand men are regularly employed at cement factories, and there are countless piers on the banks of the rivers Thames and Medway for their export and coastal trade. The blue lias lime referred to as being used in the London "tubes" contains so much silica that it may be regarded as a hydraulic cement.[6]

Clinical Reports.

The following cases show the influence of lime in the causation of local and of generalised grave dermatitis in various occupations. Recurrent cases of severe disabling dermatitis in which neither patient nor doctor has appreciated the true ætiology make it important that this unappreciated hazard should be reported. A special form of engineering, by no means confined to London, is the boring of underground

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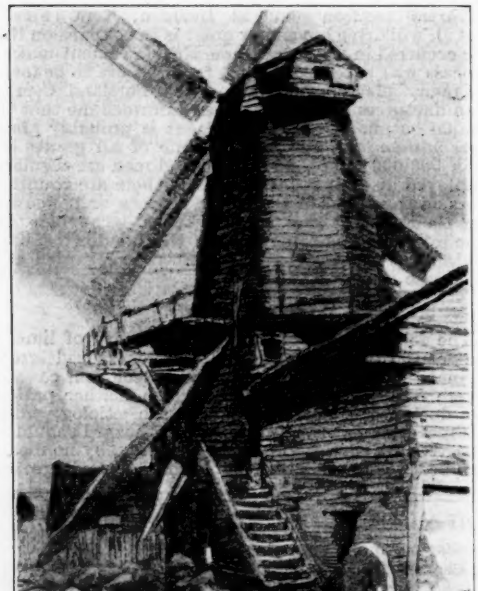
tunnels, with or without the aid of compressed-air shields. The men call themselves miners, or sometimes tunnel-miners, but without careful and pointed questioning it is doubtful if the causal link between the work and the disability could be determined in the consulting-room. This miners' dermatitis is a lime dermatitis. Five such cases of recurrent dermatitis have come to Dr. J. H. Sequ ira's clinic this year; all have been employed in the same manner, and none volunteered any guess as to the causative factor.

CASE 1. *Lime Dermatitis watched over 15 Years.*—This patient (J. U.) has been three times in hospital, and the course of his industrial history is very interesting. In 1909 he was an in-patient in the London Hospital for a month and diagnosed as seborrhœic dermatitis. Occupation: "The patient works underground and sweats considerably." He gave a month's history of an itching papular eruption on the forearms, thighs, and sternal region; the vertebral sweat furrow is free from rash. Treatment: alkaline baths, resorcin, and sulphur ointment. Discharged cured. 1911: In hospital August 31st to Oct. 2nd, with a diagnosis of exfoliative dermatitis. Occupational note: A compressed air-worker, has recently had some red-lead paint dripping

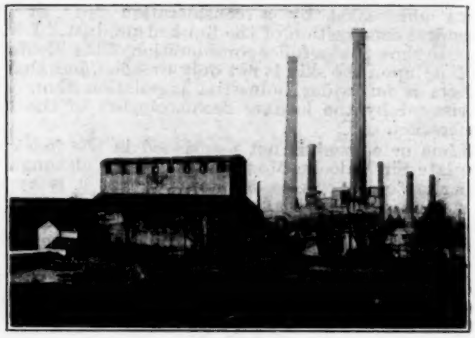
FIG. 1.



Old cement mill on the river Medway.
(*By courtesy of Associated Portland Cement Manufacturers.*)

from the tunnel shields on to his arms. He gave a one month's history of a red papular eruption, non-irritant, on his forearms, spreading rapidly on to arms and thighs. On admission there was a general erythrodermia and exfoliation, more marked on the face, arms, and legs. Treated by oatmeal baths, resorcin lotion, and an ointment of glycerol of lead subacetate. 1914: While working on the Post Office tunnel (as a grouter) outside the London Hospital he had a mild attack of dermatitis. As far as he can remember never acted as a grouter, except on the occasions mentioned above, and splashings of lead paint were a most unusual occurrence. 1924: Age now 47, has been a tunnel-miner for 26 years. He came to the skin out-patients' department on August 8th, 1924. All his attacks have been in the summer months, when he sweats profusely. His trouble started about the end of May of this year. Occupational note: He has been doing grouter's work since the end of April 24th for the *first time since* 1914, not by intention. This work is casual piece-work, depending on the amount of tunnel engineering under construction. It consists of sealing up the space between the iron shields and the brickwork of the tunnel under construction with slaked "blue lias" lime. Lime is emptied from sacks into receptacles by the

FIG. 2.



The Associated Portland Cement Manufacturers' Works at Burham, Kent.

grouter and conveyed by him with a hand-scoop to a tank of water. Both these operations are entirely hand processes. The lime is forced into the space by air pressure. At piece-work all work is at high pressure which increases the amount of dust formed. J. U. was working at an air pressure of 12 to 27 lb. to the square inch. After work, when home, this man cleaned by washing in soap and water with half a small spoon of soda to the gallon.

Condition on Admission (August 8th, 1924).—There were small boils and follicular pustules, discrete, but numerous, on both forearms, the legs, and a little on the hands. On the backs of the hands, on the dorsa of the feet, and around the wrists the skin was thick, dull pink, harsh, dry, finely scaling, and fissured over the knuckles. Around the neck and on the torso, arms, and thighs were numerous blotches of red skin. In and on the ear margins were adherent yellow scabs and small pink papules. The epitrochlear and axillary glands were moderately enlarged, painful, and tender. The patient's health was not really much affected; there was no fever, no sign of any visceral change, urine natural.

Differential blood count by Dr. H. A. Ash, of the Clinical Laboratory: Total white cells, 14,249 per c.mm.; poly. neutrophiles, 64·5 per cent.; poly. eosinophiles, 1·5 per cent.; small lymphocytes, 16·5 per cent.; large lymphocytes, 3·0 per cent.; large hyaline cells, 14·0 per cent.; coarsely granular basophiles, 0·5 per cent.; Wassermann reaction positive; no leucoplakia. (Fig. 4.)

It is unique in my experience that with an account of a dermatitis extending over 15 years, recurring only when occupied on a particular process involving contact with lime, the connexion between cause and effect should never even have been suggested by the sufferer, who in this case is above the average in intelligence.

CASE 2.—A. C., aged 43, a tunnel-miner, came to Dr. Sequeira's clinic on May 10th, 1923, for a second attack of dermatitis. He said that his work was to blow lime into the casing of underground tubes. On both forearms, particularly on the hairy aspects, were many large discrete follicular pustules and scabs. The rest of the skin was unaltered in texture, there was no adenitis, the nails were unaffected. He was well in a fortnight.

CASE 3.—H. D., aged 42, has been a "miner" in tunnels for 29 years. Had a skin attack 17 years ago, and frequent attacks since. All previous attacks affected the forearms only. His present trouble started three months ago in the same sites, but has extended rapidly. On examination (Feb. 28th, 1924) his forearms were pink, dry, and scaling all over, his palms dry, thick, and hard, and his whole skin was drier than normal (ichthyosis). The skin of the scrotum and the adjacent parts of the thighs was moist, macerated, and reddened. He was treated with calamine lotion and a bromide mixture and in two months was well, save that

he had now, away from work, become more neurotic. His original lesions were gone, but he had developed pruritus ani with peri-anal excoriation.

CASE 4.—W. G., aged 59, was sent to the skin clinic of the London Hospital on Oct. 14th, 1924, as a "toxic rash." By occupation he was an underground tunnel-miner and had been mixing and using "blue lias" lime for 24 years. He knew three fellow-workers affected like himself by their work. There were no facilities for washing at his job. This was his first attack, and had lasted for six weeks. The rash started on the forearms and was now widespread on the limbs and face. There was a red, oozing, and scabbed confluent rash on the forearms, most intense at the wrists, the legs a dull pink with patches of fine desquamation, there were discrete red or pink papules on the forehead, face, and trunk. There was no adenitis and no fever, no boils, the general health was unaffected. He was admitted for rest and to avoid the complications that might be set up under unfavourable home conditions. (Fig. 3.)

CASE 5. *Lime Erythrodermia.*—T. L., aged 57, has been a street mason from the age of 19, handling lime daily to make mortar. He has always had good health and, save for a few boils on the neck in the last 12 months, has had no previous skin trouble. His rash started early in July, 1924, in the form of itching red pimples on both forearms, and spread in three weeks to the thighs, head, and trunk in this order. He first came to out-patients' department on August 12th, 1924, showing then a general bright erythrodermia with scaling from his scalp to his feet with no islands of unaffected skin. He was made an in-patient on August 12th, 1924; his skin was red all over and hot to touch, it was thickened with a criss-cross exaggeration of the normal skin pattern. Desquamation was slight and was confined to the scalp and face, the feet and legs pitted on pressure. A blood examination by Dr. Ash, of the Clinical Laboratory, on

FIG. 3.

Case 4.—W. G., Scabbed and fissured erythema due to lime.

Dec. 8th, 1924, showed erythrocytes, 4,125,000; hæmoglobin, 78 per cent.; colour index, 0·98; leucocytes, 11,500 per c.mm. Stained blood: Polynuclear neutrophiles, 63·5 per cent.; polynuclear eosinophiles, 6·5 per cent.; small lymphocytes, 18·5 per cent.; large lymphocytes, 2·5 per cent.; large hyaline cells, 9 per cent.

On examination I could find no physical signs of visceral disease. Examination of the C.N.S. showed an anæsthetic soft palate, insensitive sclerotics, no other abnormality. After three weeks rest in bed the colour of his skin lessened to a pink, but an evening rise of temperature to 101° F. coincided with the development of numerous boils which came out in successive crops over three weeks, after which the patient slowly and steadily recovered.

CASE 6. *Housewife's Lime Dermatitis.*—E. S., aged 32, married, a brunette, came on July 22nd, 1924, with a vesicular eruption of two weeks' standing on the backs of her hands and fingers. At the beginning it was irritating, but had now become painful. She attributed it to using chloride of lime in her washing tub. She ceased attending after a week's treatment. E. S. attended again on Dec. 2nd, 1924, with a rash on her hands, mostly the right, of four days' duration. There was a confluent vesicular outbreak, mostly on the dorsum and between the four fingers of the right hand. These vesicles were ruptured in some places, leaving red excoriated areas. The fluid in unruptured vesicles was white and opaque. On the back of the wrist and over the base of the right thumb were discrete vesicles of pin-head to millet-seed size. The right palm was sweating freely; the left hand was very much less affected, the lesions itched. There was no regional adenitis and no fever, the tongue was clean, many teeth were carious. Calamine liniment was applied and in a week all vesicles were gone, she developed no perionychia and no follicular pustules. (Fig. 5.)

S. Norman Dykes [7] has described in a letter a case of generalised dry scaly eczema with painful fissures in a foreman "rough-caster" working in cement, and notes his inability to find any reference to cement as a cause of occupational dermatitis. J. C. Lyth [8] has described the case of a man, aged 38, a plasterer's labourer working chiefly in cement, who had four attacks, of increasing severity, of desquamation, at first discrete on the arms and hands, and later "both hands and forearms completely covered with a

FIG. 4.

Case 1.—J. U., Follicular pustules in a "tunnel-miner."

profusely exfoliating eczema." An unsigned letter in THE LANCET in 1917 records that Portland cement if moistened and allowed to adhere to the fingers for half an hour, blanches and shrivels the fingers, and bores pin-holes in the tips.[9]

Perforation of the Nasal Septum.

I have been unable to find any English reference to perforations of the nasal septum due to lime, but the

FIG. 5.

Case 6.—E. S., Recurrent excoriated vesicular eruption due to bleaching lime in the household washing.

following quotation, although not a case-record, is definite:—

CHAUX: Elle exerce cependant une action de brûlure sur le peau et les chaufourniers s'en garantissent en se graissant fréquemment les mains avec du suif. Ciment: La poussière de ciment, dont l'influence sur l'organisme n'est pas définie. . . . Il se produit dans le cloison nasale, à sa base, une perforation de dimension variable. . . De plus, il est recommandé aux ouvrières d'adopter une coiffure protectrice pour empêcher l'action irritante et caustique des matières manipulées sur le cuir chevelu.[10]

Summary.

(1) Lime dermatitis is now to be looked for in a wide field of industrial life. (2) The patient's trade label is often a most insufficient guide to this special industrial hazard. (3) A small group of cases is recorded amongst "tunnel-miners" not hitherto reported as liable to lime dermatitis. (4) The types of dermatitis that may be seen are vesicular eruptions or cheiropompholyx, lime holes, seborrhœic eczema, exfoliative dermatitis, intertrigo, erythrodermia, pustular follicular dermatitis, and septal perforation. (5) Over-sweating or abnormal dryness of the skin are predisposing factors. (6) Preventive measures consist in frequent changes of all dust-laden underclothing, alternation of employment on to lime-free work, and the nightly application of emollient grease to the skin of the face, hands, and forearms.

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THE ÆTIOLOGY OF HÆMOPHILIA.

BY J. W. PICKERING, D.SC. LOND.,

AND

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THERE is no unanimity in the views which have been suggested to explain the delay in clotting of hæmophilic blood, and treatment remains empirical. Two cases are here recorded in which the characteristics of hæmophilic blood closely resembled those of embryonic blood. In both complete coagulation was produced by raising the temperature of the shed blood to 38° C., without the addition of coagulants.

Critical Summary of Previous Work on Hæmophilic and Embryonic Bloods.

Sahli[1] found that the same amount of fibrin can be obtained from both hæmophilic and normal blood. Adopting the theory of blood coagulation suggested by Morawitz,[2] he maintained that the delayed clotting in hæmophilia is due to a shortage of thrombokinase in the wounds of the bleeders. This opinion was supported by Morawitz and Lossen,[3] who found that the addition of tissue extracts to hæmophilic blood hastened its coagulation. Nolf and Herry,[4] however, maintained that the thrombokinase is altered in quality instead of in quantity. The deficiency theory is commonly accepted in current text-books, and Vines,[5] in his recent review of the subject, classed hæmophilia with cystinuria and alcaptonuria as a deficiency disease, dependent on the lack of a ferment. No proof is, however, available that damaged cells or tissues contain a coagulant enzyme. Moreover, it is well known that contact with wounded tissues is not necessary for the clotting of blood, and recent work indicates that the detritus of leucocytes and blood-platelets, the supposed other sources of thrombokinase, is not an essential factor in the inception of blood coagulation (Pickering[6]). Addis[7,8] found that hæmophilic blood is clotted as rapidly by thrombin as is normal blood, and that thrombin obtained from the blood of bleeders is as active a coagulant as that prepared from normal blood. He thus demonstrated that restraint of clotting in hæmophilia occurs prior to the formation of thrombin. This investigator also concluded that in hæmophilics: (1) There is no substance in the blood which hinders the coagulant action of thrombin, an opinion supported by the researches of Hurwitz and Lucas,[9] of Hess,[10] and of Klinger.[11] (2) There is no deficiency of thrombokinase either in the body tissues or the formed elements of the blood. (3) Thrombin, and its mother-substance pro-thrombin, are present in normal quantities, a conclusion endorsed by the recent work of Wöhlisch,[12] who also found that the fibrinogen is normal in amount and behaviour.

Having found that the generally recognised factors in blood coagulation are present in their usual quantities, Addis suggested that the defect in hæmophilia is that a longer time is taken for the conversion of pro-thrombin into thrombin. Howell,[13] Hurwitz and Lucas,[9] and also Klinger[11] have, however, maintained that there is a deficiency of pro-thrombin, while Fiessly[14] has recently asserted that there exists in both hæmophilic plasma and serum a substance which inhibits the formation of pro-thrombin. No indication of the nature of this substance is given.

Very little has been published on the coagulability of embryonic blood. More than 50 years ago, Boll[15] recorded that the blood of embryo fowls does not clot before the twelfth to fourteenth day of incubation. Emmel, Levison, and Fisch[16] recently noted that the blood of late pig embryos clots much more slowly than that of adult pigs, but is coagulated, at room temperatures, by the addition of calcium chloride. Finding the total calcium content is not below the normal, they concluded that the retardation of clotting is due to a deficiency of ionised calcium. Most investigators are agreed that there is no abnormality in the calcium content of typical hæmophilic blood, but Hess[10] has recorded a case of sporadic hæmophilia in which there was a shortage of ionised calcium. The blood of this person, like that of the embryos, was clotted by the addition of calcium chloride.

Experiments on Embryonic Blood.

Whilst investigating the ontogeny of the plasma of embryo chicks, we have found: (1) The mixture at laboratory temperature (14°–16° C.) of the blood of eleventh-day embryos with an equal volume of freshly shed normal human blood inhibits clotting. Samples of human blood, which were completely clotted in open vessels at room temperature in five or six minutes, remained fluid for an hour after mixing with the embryonic blood, provided the mixture was made not later than 30 seconds after the withdrawal of the human blood from the circulation. When the embryonic blood was mixed with the human blood, which had been shed on glass for three minutes—i.e., just before the formation of clots—no suppression of clotting occurred. The blood of the eleventh-day chick does not clot either at room or body temperature, does not give reactions indicative of either pro-thrombin or fibrinogen, but contains material which coagulates when heated to 74°–75° C. (2) The blood of twelfth-day chicks remains fluid on glass at laboratory temperatures, but clots rapidly at 38°–40° C. It apparently contains fibrinogen, is clotted by thrombin, and is partially clotted by the addition, at room temperature, of considerable quantities of tissue or cell detritus—i.e., by the so-called thrombokinase. Clots do not, however, appear in the blood oozing from damaged blood-vessels. At laboratory temperatures a mixture of this embryonic blood with an equal volume of normal human blood clots at almost the same speed as human blood. A mixture of human blood with one and a half times its volume of the embryonic blood shows, however, some retardation of clotting. When two volumes of the embryonic blood are used the suppression of clotting is usually more marked. (3) The blood of fourteenth-day chicks remains fluid on glass at laboratory temperatures, but clots rapidly on the addition of small amounts of calcium chloride. In other respects it behaves like adult birds' blood.

When added to an equal volume of human blood it accelerates clotting.

It thus appears that material protective against the *inception* of clotting is developed in birds' blood prior to the development of its capacity to clot and that this material is not an anti-thrombin, as it does not restrain the later stages of clotting in which thrombin is developed. It seems that early embryonic blood differs from normal adult blood by the predominance of stable protective material.

Experiments on Hæmophilic Blood.

CASE 1.—Blood was obtained by finger puncture from a male, aged 20, who was suffering from an effusion of blood into the right knee-joint. Since childhood the patient had suffered from prolonged bleeding from small cuts and from the gums. Two of his brothers had suffered from protracted bleeding from small injuries, and one of them had died in hospital from hæmorrhage. The patient's blood exhibited the following characteristics: (1) It remained fluid in a glass vessel, at room temperatures (16°–17° C.), for an hour. (2) At 38° C. it clotted in 8 minutes 30 seconds. The clot formed was firm and adhered to the walls of the containing vessel; it subsequently contracted and exuded serum. (3) It clotted immediately at room temperature on addition of the clot obtained by warming the hæmophilic blood. (4) It clotted in three to four minutes, at room temperature, after addition of the hæmophilic serum. (5) Mixed with an equal volume of normal human blood, immediately after the normal blood had been shed, it lengthened the clotting time of the normal blood from 6 minutes 40 seconds to 13 minutes 40 seconds. (6) When the mixing took place after the normal blood had been shed for four minutes no retardation of clotting occurred. (7) It was not clotted by the addition of an equal volume of 2 per cent. calcium chloride.

CASE 2.—Blood was similarly obtained from a male, aged 54, who suffered from periodic epistaxis and from prolonged bleeding from small cuts. Such hæmorrhages were, however, usually arrested in 15 or 20 minutes. Blood coagulation-times, taken by the method of Pickering and Hewitt,[19] showed considerable variation during the two years the case was under observation, clotting being sometimes complete in 10 minutes, on other occasions occupying from 15 to 20 minutes. One brother and a maternal uncle were described as excessive bleeders; the sisters and a daughter appeared normal. At the time of the experiments here recorded complete clotting was obtained at 17° C., on glass, in 46 minutes 30 seconds. At 38° C. complete clotting on glass occurred in 6 minutes 5 seconds. The application of a wet bandage at 118° F. to a finger-cut completely prevented oozing of the blood in 9 minutes; oozing through a cold bandage continued for 20 minutes. (The room temperature was 15·5° C.) The addition of the patient's own fresh serum or blood-clot provoked clotting at room temperature in 5 and 4 minutes respectively. The mixture of equal volumes of the abnormal blood with normal human blood at 15·8° C. yielded a coagulation-time 2 minutes 40 seconds slower than that of the normal blood. When mixing was delayed until 4 minutes after the normal blood had been shed the coagulation-time was 3 minutes faster than that of the normal blood.

Discussion.

The preceding experiments show marked resemblances in the behaviour of the blood of early embryos and that of the hæmophilics investigated. Both the bloods, when added immediately to normal human blood, retard its coagulation, but neither inhibits the later stages of clotting in which thrombin appears. Blood from the severe case had greater protective power against the inception of clotting than was exhibited when the hæmophilia was less marked. Both early embryonic and hæmophilic blood are relatively stable at room temperatures and both clot in glass vessels at 38° C. Both are refractory to the coagulant action of tissue detritus (the so-called thrombokinase), and identity of behaviour occurs in all the other reactions recorded, except that the addition of small amounts of calcium chloride clots the embryonic blood as soon as its capacity to clot is developed, but does not clot the hæmophilic bloods. In this one respect the embryonic blood resembles the blood of the case of sporadic hæmophilia recorded by Hess [10] and differs from typical hæmophilic blood. A probable explanation of the facts is that in hæmophilia there is either a partial persistence of an embryonic condition of the plasma in adult life or a return to the embryonic state.

Evidence has been advanced in the papers of Pickering and his co-workers that there exists in normal circulating blood a protective colloid, which preserves the clotting complex of the plasma from change. It appears that when normal blood is in contact with surfaces which it wets, this protective colloid rapidly undergoes change and is disassociated from the clotting complex of the plasma. Pro-thrombin is then converted into thrombin, which converts the fibrinogen of the blood into the fibrin of clots. It has been shown by Pickering and Taylor [17 18] that the addition of various inert protective colloids to freshly shed blood inhibits the inception of clotting, but fails to suppress the coagulant action of thrombin on either blood or on fibrinogen. A similar condition to that of the blood in the milder case of hæmophilia has thus been produced in vitro by increasing the concentration of protective colloid in otherwise normal blood. The protective material of eleventh-day bird embryos appears not to undergo change in the act of bleeding, hence its addition to freshly shed blood suppresses clotting to a degree equal to that found in the severe case of hæmophilia. Hæmophilic blood only slowly changes towards clotting when shed, and the suppression of clotting apparent when it is added to normal blood is in like manner intelligible as due to the presence of an excess of a stable protective colloid.

Although the total protein content of hæmophilic serum appears to be less than that of normal blood, a globulin is present in excess (Hurwitz and Lucas [9]), and we have found that embryonic plasma at the time when it is highly protective against the clotting of adult human blood consists mostly of material which coagulates at 74°–75° F., at the heat coagulation temperature of a globulin.

One of the most troublesome and apparently inexplicable features of hæmophilia is the continued oozing of blood through wounds which contain clots and presumably thrombin. The presence of unclotted blood bathing cuts, even at body temperature, is not, however, without parallel in experimental work. Pickering and de Souza [20] observed that if threads are introduced into the ventricles of a living heart, separated from the circulation by mass ligature, massive clots are formed, but some blood remains fluid. This clots immediately it is shed on glass. The fluidity of the blood in contact with clots is intelligible as due to the presence, in vivo, of undisturbed protective colloid; its rapid clotting when shed may be ascribed to disturbance of the protective colloid followed by the coagulant action of the thrombin present. In a similar but more marked manner the excess of protective colloid in hæmophilic blood prevents the thrombin formed in wound clots from acting on the fibrinogen of oozing blood. Similarly, an excess of protective colloid or the presence of a protective colloid of unusual stability would delay the conversion of pro-thrombin into thrombin, and there is no need to assume that the pro-thrombin of hæmophilics is either deficient in quantity or altered in quality. The coagulant action of tissue extracts on hæmophilic blood is also explicable without assuming a deficiency of "thrombokinase." The work of Pickering and Hewitt [21] indicates that the detritus of cells and tissues disturbs the surface conditions of the plasma, and such disturbance accounts for its coagulant action on hæmophilic blood.

Summary.

(1) The hæmophilic bloods examined coagulated in 6–8 minutes at 40° C. This property may possibly be utilised in controlling oozing from wounds and epistaxis. (2) Hæmophilic plasma exhibits most of the characteristics of early embryonic plasma. (3) The protective power against clotting of both hæmophilic and embryonic blood is not due to the presence of an anti-thrombin. (4) It appears probable that the delay in the clotting of the

hæmophilic bloods examined is due to the persistence or reappearance in adult life of an embryonic condition of the plasma, and that in both hæmophilic and embryonic blood there is present a relative excess of a stable protective colloid. This conclusion is concordant with the theory of the fluidity and clotting of blood enunciated by one of us.

It is hoped that those in touch with cases of hæmophilia will communicate with us (at King's College, W.C. 2) and thus assist in this inquiry.

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HÆMORRHAGE DURING DISSECTION OF THE FAUCIAL TONSILS.

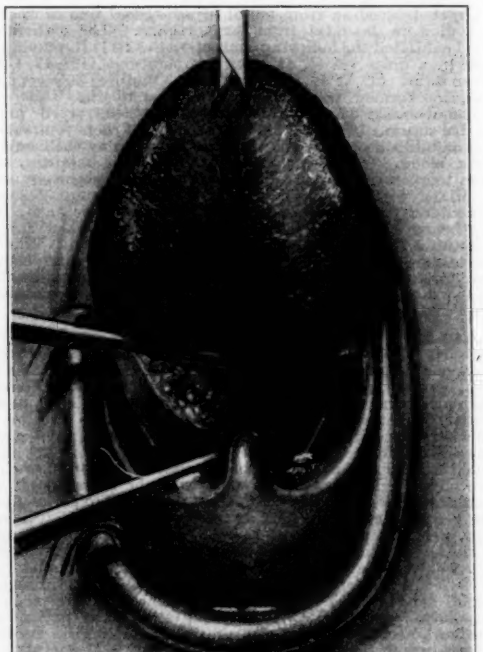
A SCHEME FOR CONTROLLING THE VESSELS BEFORE DIVISION.

BY NORMAN PATTERSON, F.R.C.S. ENG.

ENUCLEATION by one method or another is now the routine practice in dealing with enlarged or septic tonsils. Each surgeon soon acquires a technique of his own, which from time to time he may modify. So long as the tonsil in its capsule is removed with as little damage as possible to the mucous membrane and muscles, and the resulting fossa is absolutely free from bleeding at the end of the operation, the procedure can be pronounced as satisfactory.

Technique.

As far as the exposure of the capsule is concerned, the technique which I adopt is much the same as that generally practised. It is important to preserve not only the pillars, but also any mucous membrane lying between the pillars and the tonsil, including the plica semilunaris. The mucous membrane is first of all divided in front, above, and behind, and the capsule exposed, keeping as close as possible to the tonsil and generally well behind the edge of the anterior and in front of the edge of the posterior pillar. The next step is the separation of the lateral part of the tonsil from the bed in which it lies, making no attempt to free either the upper or lower poles from their attachments. It is mainly in the region of the upper pole that the blood-vessels run to and from the tonsil, and an attempt even by blunt dissection to free this pole will probably result in tearing vessels with resulting hæmorrhage. When the middle portion of the tonsil in its capsule has been freed from the pharyngeal wall, the tonsil itself is drawn medially and forwards with a vulsellum. One blade of a large pair of artery forceps, which may conveniently be curved, is then passed through the opening which now exists between the capsule of the tonsil and the pharyngeal wall; the other blade of the forceps lies in front of and internal to what may for convenience be called the upper tonsil "pedicle." Half an inch or more of the blades should project beyond the clamped portion of the tissue. The tonsil is again dragged somewhat forcibly forwards and medially, and the forceps are closed, taking care that no tonsillar tissue is included between their blades. With a pair of scissors the "pedicle" is now severed on the tonsil side of the forceps. The tonsil is then freed in a downward direction towards the base of the tongue by blunt or swab dissection. In using a metal dissector it is important to work at right angles to the plane of cleavage, and, so to speak, to tease the capsule from its surroundings. In this way bleeding is much less likely to occur. Occasionally a moderate-sized vessel will be seen and can be clamped before division. The dissection is continued in a downward direction till a "pedicle" attaching it to the tongue appears. This "pedicle" is clamped with a pair of stout artery forceps, the points passing downwards and backwards towards the epiglottis. The tonsil is cut across on its own side of the forceps. It is now only necessary to secure each "pedicle" with a ligature, and, if the points of the forceps have been left free, no difficulty will be experienced in passing this ligature.



Left side.—The tonsil is now separated and ready to be cut away.

Right side.—The ligatures are shown in position. At the end of the operation the one on the lower tonsil "pedicle" is generally out of sight.

Any redundant tissue which is present, if desired, can be cut away, but if stout forceps have been used, and if the ligature is tightly tied, the remains of the "pedicles" will slough.

Remarks.

In simple cases, if this method of removing the tonsils is adopted, there will be very little hæmorrhage since the main vessels are clamped before they are cut; there will be no danger of the ligatures slipping, as they surround substantial portions of tissue, and much time will be saved as all searching for bleeding and retracted vessels is avoided. It may not be possible to carry out this manœuvre in every case—e.g., if the tonsil is very adherent, or its capsule partially destroyed as the result of one or more attacks of quinsy, or owing to previous and unsuccessful attempts at removal. But even in such cases the principle can be adopted of trying where possible to apply a clamp before cutting any structure that is likely to bleed. It is advisable to perform the operation deliberately, and to avoid all tearing. Any attempt at rough manipulations will be followed, most probably, by hæmorrhage, and

much time may be lost by searching for bleeding vessels after the operation is virtually completed.

The writer carries out the whole of the dissection with one instrument—namely, a pair of long blunt-pointed scissors curved on the flat.

Clinical and Laboratory Notes.

DUODENAL ULCER IN A CHILD OF TWO MONTHS.

BY J. A. L. LOUDON, M.B., CH.B. EDIN.

THE following case presents some features which, in the light of the post-mortem findings, seem worthy of record.

The child, a male, was the first child of a mother aged 37. The father is 36. The labour was normal and the child weighed 6½ lb. at birth. From the first the child was difficult to rear. The breast milk was very poor in quality and quantity, and it was immediately apparent that artificial foods would have to be resorted to. The baby was accordingly put on to cow's milk and water, with added sugar, of rather under the normal strength. He was fed three-hourly.

During the first few days the child cried incessantly and had difficulty in passing urine. Circumcision was performed and thereafter the baby seemed brighter, cried less, and took his feeds satisfactorily though slowly. The stools, however, were slightly green and streaked with mucus, and there was vomiting in a mild degree of a regurgitant character. For the first month the baby put on weight very slowly. The stool varied in character from slight greenness to greenness throughout. There was always mucus present. The feeds were taken very slowly. The baby was sometimes as long as three-quarters of an hour over his feed. He cried a great deal and in any circumstances would never lie on his back without crying. He almost invariably slept for seven hours during the night without a break. The weight at the end of the first month was 7¾ lb.

On account of the evident pain and the condition of the stools I decided to try glaxo. This was given, and the strength of the feeds kept below normal. The stools then assumed a brownish character and were slightly constipated. The mucus, however, entirely disappeared. The child occasionally gave a loud cry which lasted only a few moments. Weight was gradually lost; the extremities became cyanosed and the child became pinched and cried continuously even during the night. The vomiting returned after every feed, and I advised alternating feeds of albumin-water and glaxo. For a day or two there was some improvement. Pressure on the abdomen seemed to give relief to the child and he would lie contentedly enough on his stomach. After 12 days on glaxo I put the child on nothing but albumin-water for two days. There was then no sickness and very much less crying. Having had poor results with glaxo I tried Nestlé's, again in reduced strength. The result was disastrous, though I am sure any kind of food would have produced similar results. More weight was rapidly lost; the crying was incessant, and the vomiting was almost, if not quite, equivalent to the entire feed.

In despair I called in Dr. Lewis Thatcher in consultation, and on his advice the child was put on to equal parts skimmed milk and water with no added sugar. There was slight improvement for four days, and emboldened by this I added a quarter of a teaspoonful of glucose with each feed. On the third morning before the child died the stool looked suspicious. It was dark brown, constipated, and on one part of the napkin there was a hint of altered blood. The temperature was 96·4° F. in the rectum and the child was wasted. Next morning a typical melæna was observed—a dark tarry stool with much almost unaltered blood. Dr. Thatcher again saw the child, who was removed to the Edinburgh Royal Hospital for Sick Children, and the same evening transfused. Another hæmorrhage occurred and the child died.

Post-mortem Examination.—On the posterior wall of the first part of the duodenum there was an acute ulcer, ¾ in. in length, square, ¼ cm. distant from pyloric sphincter, and having the long axis parallel with that of the bowel. The margins were clearly cut and sharply defined and there was no evident induration of the floor or edges. The floor was smooth and seemed to be formed of submucous coat, and on it several minute bleeding-points could be seen. There was a second small ulcer situated nearer the pylorus on the anterior wall of the duodenum; this affected the mucous membrane only. There were also several mesenteric cysts containing yellowish or turbid fluid.

To Dr. J. S. Fowler, whose ward the child was in, and to Miss A. R. MacGregor, pathologist to the hospital, I am indebted for the post-mortem report.

Edinburgh.

A CASE OF CEREBRAL ABSCESS COMPLICATING EMPYEMA: OPERATION AND RECOVERY.

BY ARTHUR F. HURST, M.D. OXF., F.R.C.P. LOND.,
PHYSICIAN AND NEUROLOGIST TO GUY'S HOSPITAL.

IN THE LANCET of Jan. 17th last Mr. Seymour Barling described a case of cerebral abscess complicating abscess of the lung in which recovery followed operation, the patient being at work and in good health some months later. Although operations have been performed on a few cases of the kind before, Mr. Barling was unable to find any previous record of recovery. The following case appears therefore to be worthy of publication, particularly in view of the fact that the patient is still alive and well 13 years after the operation.

Mr. T., aged 57, consulted me on Jan. 31st, 1912. In the previous August he had had an attack of acute appendicitis, a gangrenous appendix having been removed on the second day. Seven weeks later pleurisy developed, and on Oct. 6th, 1911, an empyema was discovered and three quarts of foul pus were evacuated. The wound continued to discharge until Jan. 25th, 1912. Ever since the first operation the patient had felt very slack and disinclined to do anything for himself. He could only be persuaded with great difficulty to dress or go for a short walk. On Jan. 14th he was sick several times after supper, and his left hand and arm were drawn up, his left leg twitched, and his eyes were directed towards the left, but he did not lose consciousness. During the next three days he had hallucinations, and from this time his temper became very bad. On the 28th he dropped his cards whilst playing bridge and dropped his food on to the floor during meals, but, though dazed, he did not lose consciousness. His mental capacity was unaffected; he was quite rational when discussing business and his memory remained excellent. His temperature had been slightly raised at times ever since the first operation; it had reached 100° F. on Jan. 26th and 28th. He had complained at times of a pain on the top of his head.

On examination he was found to have complete left-sided hemianopia, with incomplete left hemianæsthesia, touch being more affected than pain. There was very slight weakness of the left arm and leg, but the left hand was extremely clumsy owing to well-marked arterognosis. The deep reflexes of the two sides were equal. The left plantar reflex was extensor, the right flexor. The left abdominal reflex was absent, the right brisk. The optic discs were normal, except for some venous engorgement. A diagnosis was made of an abscess just behind the centre of the right ascending parietal convolution. This having been confirmed by Dr. E. Farquhar Buzzard, to whom I am indebted for allowing me to see his own notes of the case, Mr. Percy Sargent operated. An abscess was found in the area indicated just below the surface, the brain substance superficial to it being red and œdematous; about two ounces of yellowish-green, fœtid pus were evacuated. The abscess was drained and improvement was rapid, but was interrupted on March 24th, 1912, by an attack of acute mania, lasting ten days, just after the patient returned home.

Recovery from this was complete, and now, at the age of 70, and 13 years after the operation, he is still perfectly well in every way.

ROYAL LIVERPOOL CHILDREN'S HOSPITAL.—The annual meeting of the hospital on Feb. 26th was made the occasion of the announcement of extensive plans for extension. At the Myrtle-street city branch further accommodation for nurses and new residents' quarters are being provided, incidentally freeing space which is to be utilised for a ward devoted to accidents and minor operation cases. At the Heswall country branch a new wing is in contemplation with 60 beds. The year's expenditure was balanced as follows: Subscriptions, &c., 25 per cent.; dividends from investments, 20 per cent.; parents' contributions, 40 per cent.; the remaining 15 per cent. being deficit.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

COMBINED MEETING OF THE SECTIONS OF COMPARATIVE MEDICINE, TROPICAL DISEASES, OBSTETRICS AND GYNÆCOLOGY.

A MEETING of these combined Sections was held on March 12th, Prof. L. S. DUDGEON, President of the Section of Tropical Diseases, in the chair, when Prof. J. H. EYRE opened a special discussion on

Infective Abortion in Cattle and its Relation to Mediterranean Fever.

Prof. Eyre commented upon the relationship of the *Bacillus abortus* to the *Micrococcus melitensis*, which was so close that American observers had classified them in the same genus—*Brucella*, a method he considered cumbersome and unpractical. The clinical picture of contagious abortion in cattle, he said, was a clear-cut one. There were no premonitory symptoms till abortion took place, then a vaginal inflammation was noted, together with a discharge which contained pus cells and the specific organism; moreover, the animal which had once aborted in this manner appeared liable to do so at some future period. The path of entry of the organism appeared to be via the mouth, as a general rule, but male ruminants appeared to be carriers of the infection and thus communicated the disease during coitus. The *Micrococcus melitensis*, on the other hand, did not seem to produce any specific clinical appearances in goats; but an animal once infected with the organism remained capable of infecting others for the remainder of its life. Undulant fever in man was a very definite entity; it was a septicæmia which might run an acute or subacute course. As in goats, the path of infection was by the alimentary tract, though it might take place by inoculation. The goats themselves might be originally infected by the goat-herd and the infection was thus passed on from one animal to another. Contagion from one goat to another might also take place by sexual contact. In *Micrococcus melitensis* infection the period of incubation in the goat was about 7 days; in man 5–16 days. In freshly infected herds, he said, abortion in pregnant goats was liable to take place, while Evans, in America, had produced abortion in a cow by intravenous injection of *M. melitensis*. The speaker did not agree with American workers that the two organisms were morphologically identical. It was stated by Bang that *B. abortus* behaved like a bacillus when freshly isolated, but he (Prof. Eyre) considered that the bacillary forms which had been noted in *M. melitensis* cultures were merely involution forms, such as commonly occurred among the coccaceæ, and that these were not, as American bacteriologists asserted, the characteristic shape of the organism. Under the dark-ground illumination the behaviour of the two organisms is quite different. The correlation of the two organisms, and the diseases they produced, had arisen from a number of fortuitous circumstances; thus, Bassett-Smith originally showed that the milk of some London cows would agglutinate *M. melitensis;* but Nicolle and Conseil injected men with *B. abortus* without producing any untoward symptoms, though recently, on epidemiological grounds, Bevan had suggested that in Rhodesia undulant fever in man was due to infection with *B. abortus;* and by serological reaction Evans considered the two organisms identical.

Mr. L. E. W. BEVAN, F.R.C.V.S., whose paper was read in his absence, directed attention to his original observations published in the Transactions of the Roy. Soc. Trop. Med. and Hyg., vol. xv., No. 7, p. 230, that the serum of animals suffering from epidemic abortion would agglutinate cultures of *M. melitensis*, and he suggested that undulant fever in Rhodesia, as it occurred in man, was in fact due to *B. abortus*, and quoted a case from Baltimore, recorded by Evans, in which the organism isolated from a human case of undulant fever was shown to be due to this organism. On the whole, he said, veterinarians did not consider the two diseases identical, mainly on the ground that milk from cows suffering from contagious abortion was used very extensively without producing any ascertainable disease in man in England; but in Southern Rhodesia a great number of cases of undulant fever in man came from districts known to be infected with contagious abortion in cattle, and the serum of these patients agglutinated *B. abortus*. Though considered by the majority of settlers to be a disease of recent introduction, he had evidence that the infection had long existed in native stock in the country. He was of the opinion that *B. abortus* and *M. melitensis* were identical and belonged to the same genus—"*alkaligenes.*" He thought that possibly through long contact with goats and cattle the natives of Rhodesia were immune, but the first cases of undulant fever in European settlers were noted in the vicinity of Salisbury in 1921, and there were many districts where contagious abortion was common and undulant fever unknown. So far 35 human cases had been reported, 26 in men, 4 in women, and 5 in children, and the disease had occurred in all professions, not necessarily farmers. It was generally believed that the disease was contracted through infected milk, but so far no casual visitor to the country had become infected. Orpen and others had suggested that in Rhodesia the infection might be spread by biting insects. The clinical symptomatology of undulant fever in man in Rhodesia did not differ from that observed elsewhere, though it had been noted in one case that the vesiculæ seminales were affected, a complication commonly noted in bulls infected with *B. abortus*. Prophylactic measures were now being actively employed; all breeding bulls were being tested and those whose sera reacted were being removed, while heifer herds were being immunised by a specially prepared vaccine of *B. abortus*. Undulant fever in man had been declared a notifiable disease. A short addendum to this paper described the clinical symptoms of the disease in man as observed by Drs. Huggins and Howarth.

Sir P. W. BASSETT-SMITH referred to the spread of undulant fever from the Mediterranean littoral all over the world and how the infection was spread by the milk of apparently healthy animals. He had found that cows, mares, asses, and dogs were susceptible to infection, though unable for a long period to actively spread the disease. The probability was that undulant fever and contagious abortion were two separate diseases, for in Europe proper undulant fever was practically unknown, while contagious abortion had existed in our herds for a very long time. Pregnant women who contracted undulant fever occasionally did abort.

Prof. LOUISE MCILROY, on the gynæcological side, spoke of her investigations on the possibility of an infective organism causing abortion in women, but her results had been entirely negative; nor were female farm and dairy workers more liable to abortion than other women. She pointed out the close similarity of the course of contagious abortion in cattle and syphilis in women.

Colonel J. C. KENNEDY, R.A.M.C., recounted some investigations he had conducted in Malta in 1914, where he had found that the serum of cows in Malta would agglutinate *M. melitensis*. As a general rule, infected goats in Malta did not abort.

Dr. J. T. DUNCAN gave a brief résumé of his work on the isolation of an organism, apparently more closely allied to *B. abortus* than *M. melitensis*, from the blood of a patient who had originally contracted undulant fever in Salisbury, Rhodesia. The patient was afebrile and had suffered from no symptoms for over a month. He considered that growth on

alkaline potato might be a means of discrimination, for on this medium *M. melitensis* formed a pigmented growth, while *B. abortus* did not.

Dr. H. HAROLD SCOTT referred to the work of Ficai and Alessandrini, two Italian observers, who claimed that immune serum heated above 65° C., would differentiate the organisms, *B. abortus* being clumped above that temperature, while *M. melitensis* was not.

Mr. LESLIE SHEATHER, F.R.C.V.S., considered that many of the statements made on the clinical aspects of contagious abortion were incorrect, for in his experience a large proportion of animals which did *not* abort were infected, while the bacillus appeared to be quite incapable of evoking any clinical symptom except during pregnancy.

Prof. EYRE and Colonel KENNEDY, in replying, terminated an interesting discussion.

SECTION OF OTOLOGY.

A MEETING of this Section was held on March 7th, Dr. KERR LOVE, the President, being in the chair.

Dr. T. RITCHIE RODGER (Hull) read a communication entitled

Intracranial Infection by Erosion from Subperiosteal Abscess.

The object of the paper was to show, by the narration of cases which had come into the author's experience, that suppuration was able to extend, from a subperiosteal abscess, by a circuitous route, through the outer bony covering of the cell and a re-entry through the thickness of the cranium into the brain, and erode thence at some distance from the primary focus. A typical case in illustration was the following: A girl, aged 7, was seen by Dr. Rodger in March, 1921. Four months earlier her doctor had opened an abscess over the squamous portion of the left temporal bone and evacuated some pus. The probable cause of the infection was a coincident impetigo of the scalp. Tardy healing led to the belief that the condition was tuberculous. Two months later she complained of failing vision, and bilateral optic neuritis was found to be present. A tuberculous tumour of the brain was diagnosed, and she was referred to Dr. Rodger because of meningeal signs, with high temperature, unconsciousness, and delirium, Koenig's sign being positive. The tympanic membrane on both sides was intact and normal in appearance. There had been pain in the left ear and slight discharge for one day just prior to the temporal abscess forming. Exploration revealed a temporo-sphenoidal abscess, and from it 4 oz. of pus were evacuated. This was recovered from without incident, but the vision had not improved when she left the hospital. He considered that there had been in this case an acute, short-lived mastoiditis, resulting in a subperiosteal abscess, but without gross erosion of the cortex; that the pus then tracked upwards to the squama and there produced erosion, resolution occurring in the mastoid cells and the middle ear. In another case a subperiosteal abscess had apparently formed in the floor of the frontal sinus following an acute sinusitis, but without causing any gross erosion, and the pus had tracked beyond the limits of the sinus in an inward direction. In none of the cases narrated was the subperiosteal abscess accompanied by any gross erosion of the outer cell wall. Often in such cases there was no evidence of the path of infection, and it had probably been either via bone or the blood-stream. If the pressure was being relieved, perhaps by a free discharge into the ear or the nose, there might not be high subperiosteal pressure. When there was no such outlet, the high pressure conditions favoured erosion at some other site.

Discussion.

Mr. G. J. JENKINS thought another possible route ought to be considered—namely, between the layers of the diploetic squama in the presence of osteitis.

Mr. T. B. LAYTON said the cases exemplified the fact that it was difficult, under many conditions, to know when bone was inflamed and diseased simply by naked-eye inspection, and the difficulty was increased in the case of denser bone. He asked what was the character of the bone in the cases narrated.

Sir JAMES DUNDAS-GRANT alluded to two classes of cases. One was that in which extra-dural abscess had eroded through the bone, and its presence was indicated by œdema and bagginess at a much higher level than in simple erosion from the mastoid antrum. The second class, described by Grüber, was that in which there seemed to be no connexion with the mastoid cells, and the pointing of the abscess was at a higher level. He had seen such cases clear up following the making of a counter-opening in the roof of the meatus.

Dr. DAN MCKENZIE suggested that some of the cases of the kind were instances of osteomyelitis in which the infection travelled up and produced extra-dural and subperiosteal abscess simultaneously.

Mr. SYDNEY SCOTT spoke of two fatal hospital cases. In one, a man had had middle-ear disease, and during his convalescence from that, multiple abscesses appeared on both sides of the scalp. These were beneath the periosteum and contained a streptothrix. They were very chronic. The mastoid and ear conditions ran a fairly normal course, but the patient eventually succumbed to the abscesses, one in the frontal region leading to a localised osteomyelitis. In the second case the patient had had a large molar tooth removed some weeks before the speaker saw her. She complained of local pain and headache, and a deep-seated abscess formed in the region of the internal pterygoid, and burst in the meatus. The drum was intact, and there was no evidence of mastoid disease; but there was swelling above the zygoma, and it was thought there might be disease of the cells there. She became seriously ill, developed paralysis of the external rectus, and quickly had complete ophthalmoplegia externa, and there was tenderness in the masseter region extending to the zygoma. He explored above the zygoma and found an abscess in the region of the spheno-maxillary fossa. She suddenly developed hemiplegia and became unconscious, and Mr. Scott therefore immediately opened the temporal bone and found a large abscess in the temporal lobe. It had not made itself obvious, but had probably been present through the illness. There had been no middle-ear disease.

Dr. RODGERS, in his reply, said that in all the cases narrated the mastoids consisted of cellular bone. The intervening bone appeared to be healthy.

Otogenic Pterygo-Maxillary Abscess.

Dr. DAN MCKENZIE described the case of a woman, aged 29, to whom he was called to do a mastoid operation, the acute symptoms having come on a fortnight after the left ear had been syringed for the removal of a supposed ceruminous plug. When seen there were great pain and swelling in front of the ear. The swelling prevented the tympanic region being seen. The temperature was 100° F. Pressure in front of the ear led to copious pus being discharged from the meatus. A probe passed into the meatus led through a fistula in the bony floor into a large abscess cavity, and could be passed as far as the submucosa of the pharynx. A radical mastoid operation proved that the original disease was cholesteatoma; and the pterygoid abscess was successfully drained by enlarging the fistula in the meatal floor.

Sequestra of Labyrinth.

Mr. F. W. WATKYN-THOMAS exhibited a girl, aged 18, who, following scarlet fever, developed a swelling over the right mastoid and temporal region, and complete right facial palsy, with deafness on that side. A radical mastoid operation showed cholesteatoma, and a sinus deep to the lateral sinus led to sequestra, which were removed. The facial palsy was slowly recovering.

EDINBURGH MEDICO-CHIRURGICAL SOCIETY.

A MEETING of this Society was held on March 4th, Sir DAVID WALLACE, the President, being in the chair, when a communication was read by Dr. R. A. FLEMING and Dr. JAMES DAVIDSON on a

Case of Neurocytoma.

It was stated that lately the interpretation of tumours of the nervous system had undergone many changes, and that the present case would previously have been termed a small round-celled sarcoma. It was now recognised that neoplasms of the nervous system might be composed of developing cells of the various parts of that system. Tumours might be formed of the neuroglia, of ganglion cells with nerve fibres, or of comparatively undifferentiated antecedent cells. Tumours were found composed of the forbears of the sympathetic and chromaffin systems, of the ganglion and neuroglial cells. In 1907 Hutchison recorded ten clinical cases varying in age from 9 months to 9 years, describing a "clinical syndrome" met with in children, which he termed sarcoma of the suprarenal capsule with metastases in the bones of the skull. The onset was usually ascribed to an injury, and the first thing noticed was swelling about the bones of the skull. Other symptoms were ecchymosis of the eyelids, profound secondary anæmia, and signs of increased intracranial pressure, such as torpor and optic neuritis, together with marked proptosis. These cases proved fatal in from 1 to 6 months. The histological appearances in these cases corresponded to the neuroblastomata, but were then classified as sarcomata. Kretz in 1902 suggested that the cells of the suprarenal neoplasm might be of sympathetic origin. This was confirmed by Kuster, who called them "malignant gliomata," while Wiesel in the same year noted the structural similarity in these tumours to the developing sympathetic and suprarenal medulla of the fœtus. The varied positions of these tumours could be explained by the fact that the primitive nerve cells wandered out everywhere to form the sympathetic nervous system.

The case in question was that of a boy aged 4, who gave a history of a fall from bed two months previously with no apparent immediate ill-effects. A day or two later slight deafness and swollen veins of the forehead were noticed, and after a week undue paleness caused the mother to seek medical advice. Pains in the head developed, with nausea and vomiting, which, with persistent "black eyes," proptosis, and increase in the size of the head, caused further advice to be sought. Blindness subsequently supervened. On admission to hospital he had marked local prominences of the vertex, especially on the right, suggestive of tumour formation. The veins over the vertex were distended, and œdema of the scalp was noted. There were ecchymoses of both eyelids, and the eyeballs were markedly prominent. The boy was quite blind. The cranial sutures were open, and both fontanelles patent. He sat up in bed with his chin resting on his chest. The spleen was slightly enlarged and there was slight enlargement of the lymphatic glands. The blood showed progressive severe anæmia with leucopenia, and high colour-index with a film similar to pernicious anæmia. His intelligence was good, and his nervous system unaffected, there being no paralysis. X rays showed a woolliness of the frontal and occipital bones. After seven weeks in hospital his temperature rose, he had pains throughout the body, his head increased in size, and he died one and a half months after admission. On post-mortem examination the whole of the subcutaneous tissue of the scalp was replaced by tumour growth up to 1·5 cm. in thickness. The surface of the bone was soft and much eroded. The neoplasm had penetrated the bone and filled most of the extradural cavity, but was nowhere subdural. The growth had extended through the orbit, enucleating the eyeballs. There was no alteration in the substance of the brain. The marrow of the long bones of the upper and lower limbs was almost entirely replaced by growth which had invaded the shaft of the bones. The left suprarenal was replaced by a large dark mass. Specimens of the case were shown, together with lantern slides of the histological appearances.

Discussion.

Prof. E. BRAMWELL had not met with a similar case. He quoted a case seen recently where tumour formation in a woman of 38 had caused separation of the bones of the skull. It could be felt distinctly, and was confirmed by X rays. Regarding signs of increased intracranial pressure, he had seen a case recently of a glioma without headache, though sight was failing fast, and he mentioned a case in which accident had apparently determined the onset of symptoms of a brain tumour.

Dr. STEWART FOWLER said when this shape of cranium was seen the diagnosis rested between suprarenal tumour and sarcoma. In the former the blood picture greatly assisted the diagnosis. He had seen five cases with enlargement of the head, two of which he had correctly diagnosed. In one case of chloroma the symptoms commenced after a fall.

Dr. JOHN EASON commented on the course of the condition not being as rapid as might have been expected. He had seen the case in life and suspected that it might be a suprarenal tumour.

Dr. FLEMING, in reply, said in his case the injury, a fall, was a severe one; he thought that this had stimulated the condition. He did not think the condition in life to be one of chloroma.

The So-called Parkinsonian Syndrome and Epidemic Encephalitis.

Prof. BRAMWELL then read a paper on the So-called Parkinsonian Syndrome with especial reference to Epidemic Encephalitis. It was pointed out that the number of cases of epidemic encephalitis notified to the Ministry of Health had risen from 541 in 1919 to 1025 in 1923 and 4605 in 1924, an increase not to be explained by the facts that the disease was more generally recognised and that some of the reported cases were probably instances of remission. Among the sequelæ of epidemic encephalitis the Parkinsonian syndrome, which derived its name from its resemblance to paralysis agitans, was the most frequent and characteristic. Parkinson in 1817 defined the shaking palsy or paralysis agitans as follows: "Involuntary tremulous motion with lessened muscular power in parts not in action and even when supported, with a propensity to bend the trunk forward and to pass from a walking to a running pace; the senses and intellect being uninjured." But paralysis agitans might be recognised in the absence of tremor; Erb, for instance, among 183 cases met with 37 instances of *paralysis agitans sine agitatione*. Charcot found fault with the term paralysis agitans since weakness was a noticeable feature of the later stages only, while tremor might be inconspicuous or absent; and a relevant objection might be taken to the application of the term Parkinsonian syndrome to this post-encephalitic symptom-complex, since in these cases the rhythmic tremor was seldom observed, while, in addition, Parkinson made no mention of the immobile face and scarcely referred to the peculiar rigidity which characterises the syndrome.

The evidence bearing on the nature and mode of production of the Parkinsonian syndrome was discussed, and Prof. Bramwell remarked that had he known of the brilliant work of the late Prof. Irvine Hunter he would have hesitated to bring this communication before the Society, for Hunter in his

lectures, the first of which appeared after the title of this paper had been intimated, had not only marshalled in great detail the available information bearing on muscle tone, but had also succeeded here in replacing much interesting speculation by proved fact. The effect on muscle tone which resulted from lesions of the motor nerves, of the posterior roots, of the cortico-spinal nerves, and of the cerebellum were referred to. Decerebrate rigidity was briefly considered, and Sir Charles Sherrington's conclusions as to the existence of two features of muscle tone, firstly "contractile" tone, which determines the position of extension of the limbs and reflex standing, and, secondly, "plastic" tone, whereby if the contractile tone were overcome the limb tended to remain in the position in which it was placed. Similar phenomena had been described in man by Kinnier Wilson and others. It had long been known that in certain animals there were two kinds of muscles—viz., the red muscles, the fibres of which, smaller in size and richer in sarcoplasm, exhibited on stimulation a slow and prolonged contraction, and the pale muscles which contracted energetically. Gruetzner in 1887 suggested that the function of some muscles was that of active contraction, that of others intrinsic support. In man the two kinds of fibres were probably intermixed in different muscles in varying proportion. Again, it had been demonstrated by Boeke that the non-medullated nerve-fibres, which Tchiriev had previously shown as proceeding to the thin (red) muscle-fibres, were really sympathetic nerve-fibres, while Kulchitsky's histological observations upon the nerve-endings, published in January of last year, had demonstrated that the medullated (somatic) and non-medullated (sympathetic) nerve-fibres never terminated in the same muscle-fibre. Hunter confirmed Kulchitsky's conclusions from a study of the nerve-endings in skeletal muscles, the sympathetic and somatic nerve-supply to which had been separately divided, while further he showed the effect on muscle tone which resulted in decerebrate animals after division of the somatic and sympathetic nerve-supplies. Hunter concluded from his observations on animals and man that the function of the sympathetic nerve-supply of skeletal muscle was the maintenance of posture once the position was attained, or, in other words, that it was responsible for the property of plastic tone described by Sherrington. Further, he demonstrated that plastic or sympathetic tone was subserved by reflex arcs, the afferent limbs of which passed upwards in the lateral column to the brain stem, while further he suggested that the efferent limbs were constituted by the ponto-spinal tracts described by Buzzard and Collier. The peculiar rigidity met with in the Parkinsonian syndrome Prof. Bramwell held would appear to be an exaggerated plastic tone, of the nature of a release phenomenon, due to cutting off of cerebral impulses, as was the increase of contractile tone or spasticity which resulted from interruption of the cortico-spinal neurons, the responsible lesion being situated in the corpus striatum. It was further of interest to note that the experimental observations of Warner and Olmsted indicated that the frontal lobes inhibited decerebrate rigidity. Schuster had reported a case of frontal tumour presenting symptoms resembling paralysis agitans. From an anatomical study of this case and others reported in the literature Prof. Bramwell was of opinion that the symptoms in question are probably to be explained by pressure or other involvement of the basal ganglia, and that there was no anatomical evidence to prove that they were directly attributable to involvement of the fronto-pontine tracts.

Discussion.

Prof. W. RUSSELL remarked on the connexion between the voluntary and involuntary supply to muscle, a point of great interest, which had been worked upon to a great extent by Gaspard and lately by I. Hunter. He commented on the extent to which nerve paths had been mapped out of late years, and suggested that there might be in these conditions some interference with the psychic control in addition. Concluding, he said that these discoveries helped in the understanding of the conditions but not in therapeutics.

Dr. EASON said considerable difference existed in ideas regarding the sympathetic system. On the one hand it was taught that stimulation of this system by a flow of adrenalin caused increased action, on the other it was said that increased plastic tone was produced with immobility.

Dr. BRYCE said this sympathetic immobility might be the factor which caused a frightened hare to crouch.

Dr. FLEMING commented on the difference in mentality in the two conditions, paralysis agitans and epidemic encephalitis. In the former the mentality was alert, in the latter dull. He also referred to Hunt's work on juvenile cases of paralysis agitans.

Prof. BRAMWELL, in replying, claimed no originality for his communication. He agreed that the difference in mentality in the two conditions was great, and helped greatly in diagnosing between the conditions. Hunt's work he did not think had been corroborated. He thought the psychic point of view important, and recent work had been rather along physiological lines. He hoped that as a result of investigation some means of treatment might be arrived at.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF MEDICINE.

A MEETING of this Section was held in the Royal College of Physicians of Ireland on March 6th, Dr. F. C. PURSER, the President, in the chair.

Dr. L. ABRAHAMSON read a paper on two cases of

Congenital Dextrocardia.

The first was a case of complete transposition, with sino-auricular block. The patient, aged 43, female, consulted a doctor because of pain referred to the right præcordium and of palpitation. Her previous illnesses included two attacks of pleurisy and several attacks of gastric trouble. When 9 years of age she complained of pain in the right præcordium and was found on examination to have dextrocardia. She had had several similar attacks, and on one occasion developed a convulsion and became unconscious. On examination the pulse varied in rate from 42 to 60 beats per minute. There were frequent pauses occurring at irregular intervals. The apex beat was found in the fifth right interspace. Cardiac dullness was elicited on the right side, liver dullness on the left side, and gastric tympany on the right side. X ray examination showed complete transposition. Electrocardiograms, demonstrated by lantern slides, showed inversion of waves in lead 1, and frequent pauses due to the presence of sino-auricular block.

The second case was one of complete transposition. The patient, a male, aged 43, complained of no symptoms referable to the heart. Previous history and family history were negative. On examination the apex beat was found in the fifth right intercostal space, just inside the nipple line. Cardiac dullness and gastric tympany were elicited over the right side, liver dullness on the left side. X ray showed complete transposition. Electrocardiograms showed inversion of waves in lead 1.

In reply to Dr. T. G. MOORHEAD, Dr. ABRAHAMSON said that he had seen one case of isolated dextrocardia, and four cases of transposition of the heart and transposition of the viscera.

Dr. ABRAHAMSON also made some observations on a case of

Auricular Fibrillation with Slow Ventricular Rate.

The patient, aged 61, male, had suffered for many years from cough with expectoration. For three years prior to admission to Mercer's Hospital the cough had become associated with increasing breathlessness. On examination the patient showed orthopnœa with some cyanosis. The pulse was regular, rate 50 beats per minute. Blood pressure: 190 systolic, 85 diastolic. There was evidence of emphysema and of chronic bronchitis. The heart did not show any apparent enlargement; a systolic murmur was audible over the mitral area and was not conducted. There was some tenderness over the liver. A course of squills and digitalis had been administered before the patient came under observation. An electrocardiogram taken on Feb. 14th showed the presence of auricular fibrillation with complete regularity, rate 50 approx. Digitalis was discontinued. A tracing taken a week later showed auricular fibrillation with slow but irregular rhythm. Quinidine treatment was commenced. After a total dosage of 345 gr., fibrillation disappeared and an electrocardiogram showed return of the "P" wave, whilst there was a clear picture of incomplete heart-block with periodic dropped beats. Subsequent tracings all showed incomplete heart-block. Illustrative tracings were demonstrated by lantern slides. The case was accordingly reconstructed as follows: (1) Myocardial disease with incomplete heart-block; (2) supervention of auricular fibrillation, rate slow owing to the incomplete heart-block; (3) heart-block becoming complete, probably as a result of administration of squills and digitalis, As a result the rhythm was slow and quite regular. The case showed clearly that the slow rate during the stage of fibrillation was due to heart-block. Injection of atropine did not quicken the heart-rate.

Dr. W. M. CROFTON said it was a remarkable thing that these cases of heart-block could become unblocked. He had recently seen a case somewhat similar to the one described by Dr. Abrahamson, but the patient had rheumatism as well as the heart trouble. The patient was treated by the usual methods and improved, although irregularity was still present. He had found *B. coli* in the urine and had made a vaccine, and the patient was having injections of it. He drew attention to the possibility of making the cure in these cases more permanent by the use of vaccines, as very often only temporary improvement was got by giving quinidine.

Dr. MOORHEAD asked if the patient's clinical symptoms disappeared when the fibrillation disappeared.

Dr. ABRAHAMSON replied that cases of rheumatic heart-block generally recovered, and he thought that Dr. Crofton's case would have become free from heart-block without the use of vaccine, as in these cases the heart-block disappeared of itself. The patient's clinical symptoms had not improved from the use of quinidine, but he had not really expected that they would. He had employed the drug more from an experimental point of view. He thought the patient would always have incomplete heart-block, but this of itself would not be harmful. He had seen one case in which there had been evidence of cerebral embolus resulting from the use of quinidine, but this case had made a complete recovery. He had also seen one case in which the patient had died after receiving 3 gr. of quinidine, but he did not think that the quinidine had had anything to do with the result in this case, as the patient was of the type in which sudden death was not uncommon. The interesting point in his (Dr. Abrahamson's) case was not that the digitalis had produced heart-block, but that it had produced complete heart-block with regular rhythm. This could not have been diagnosed as a case of auricular fibrillation had it not been for the electrocardiograms.

Dr. CROFTON read a paper on Encephalitis Lethargica.

Reviews and Notices of Books.

THE CHEMICAL ASPECTS OF IMMUNITY.

By H. GIDEON WELLS, Ph.D., M.D., Professor of Pathology, University of Chicago; Director of the Otho S. A. Sprague Memorial Institute. American Chemical Society Monograph Series. New York: The Chemical Catalogue Co., Inc. 1925. Pp. 254.

THE object of these monographs is to show the relation of chemical science to other branches of work, and to demonstrate the fact, sometimes not appreciated even by chemists, that "their investigations may be connected with other work which on the surface appears far afield from their own." When one reads the list of monographs already published, and of those in the course of preparation, it is clear that the American Chemical Society have set themselves a heavy task, and provided that the monographs in themselves are of a high standard, the benefit conferred upon readers will be great.

The present volume deals with the chemical basis of immunity. The style is condensed and a great deal of information has been included in the 254 pages. In places the book resembles a catalogue of scientific facts and observations, and thus it cannot be said to form attractive reading. Prof. Wells obviously found himself faced with the alternatives of a general account in an easy style, or of a more or less complete summary of the work done in this field. He chose the latter course. Looked at from the standpoint of the experienced worker in pathology, there can be no doubt but that the monograph in its present form is the more valuable. After a general introduction and a definition of terms, the author deals with the chemical nature of antigens. The whole question is treated very fully; it is astonishing to find no reference here to the Wassermann antigen, which is discussed under another heading. The next chapter deals with immunological specificity. The author here emphasises the fact that immunity reactions, such as precipitin formation and anaphylaxis, are capable of demonstrating differences between proteins which are indistinguishable by chemical means. The modification of specificity by the introduction of various radicles into the protein is also dealt with. The chapter upon the chemical nature of antibodies is, of necessity, unsatisfactory, since nothing is definitely known concerning these bodies. The chapter consists mainly of a list of the physical properties and immunological reactions of sera containing them. The section dealing with the various theories upon the neutralisation of toxins by antitoxins is very complete; the recapitulation is judicial. Arrhenius' and Madsen's, and Bordet's views are admirably and fully set out. The theory of Ehrlich is hardly given a fair description, and it would appear that Prof. Wells either intends to ignore these views or assumes that his readers are fully conversant with them. The next chapter deals with agglutination and precipitation reactions. These have received much attention elsewhere, consequently the chapter has less general interest than some of the others. The next two chapters, dealing with "lytic reactions" and the Wassermann reaction, are the most disappointing. The general description of hæmolytic systems is almost elementary. The section upon the Abderhalden reaction is non-committal. Surely we have a right to expect an authoritative statement from a writer of such wide experience on a reaction that continues to be perpetuated in all books, though few experienced workers will sponsor its claims. It is also surprising that no mention is made of the recent work in Germany of Paul Hirsch, who employs an interfereometer to interpret the reaction. The Wassermann reaction is dealt with in an almost superficial manner. The work of J. McIntosh is only very briefly referred to. and that of Heizfeld and

Klinger and of many other observers completely ignored.

The last chapter deals with anaphylaxis and allied phenomena. Each chapter is followed by an excellent recapitulation and a series of references. The amount of work put into the book must have been enormous, and Prof. Wells has undoubtedly done a great service to those seeking information in this field. But the present volume seems to lack that personal touch which is so characteristic of the author's splendid works on "Chemical Pathology" and "Chemistry of Tuberculosis."

AN X RAY ATLAS.

An X Ray Atlas of the Normal and Abnormal Structures of the Body. By ARCHIBALD MCKENDRICK, F.R.C.S.E., D.P.H., F.R.S.E., Surgeon-in-Charge of the Surgical X Ray Department, Royal Infirmary, Edinburgh; and CHARLES R. WHITTAKER, F.R.C.S.E., F.R.S.E., Assistant Lecturer in Anatomy, Surgeons' Hall, Edinburgh. Edinburgh: E. and S. Livingstone. 1925. Pp. 222. 25*s*.

IN the first paragraph of the preface of this work it is stated: "In this atlas an attempt has been made to provide a series of radiograms illustrating the normal and abnormal structures of the body, and also the more common injuries and diseases. To lend interest to the work a few rare conditions have been added." This is an ambitious programme, and if the authors have not quite succeeded in the formidable task they have set themselves, they have at least collected together an admirable and representative collection of radiograms. It would have been an improvement from the student's point of view if a little more trouble had been taken to make clear which are the rare conditions pictured. The book is divided into four main sections—normal joints and limbs; injuries and diseases of the limbs; head, neck, thorax, and spine; abdomen. In each section radiograms are reproduced with either very brief descriptions or diagrams of the normal, or both. The pictures which illustrate the chest section, which is a region of great importance in this connexion, are too few in number. Doubtless the authors have verified their diagnoses, and have information at disposal that the reader cannot have, but the reproduction on p. 128 of a film of a case of achondroplasia looks very like that of a case of rickets, while the case of cyst of the humerus (p. 136) appears to be complicated by the presence of an exostosis. In a subsequent edition the authors could, with advantage, be somewhat more precise in the description of normal conditions if the work is to be of real value to the student.

The atlas, as a whole, is excellently produced and should make a wide appeal.

PHYSIO-THERAPY IN GENERAL PRACTICE.

By E. BELLIS CLAYTON, M.B., B.Ch. Cantab., Director of the Physio-Therapeutic Department, and in Charge of the Massage and Electrical School, King's College Hospital. London: Baillière, Tindall and Cox. 1924. Pp. 174. 18*s*. 6*d*.

THE author states in his preface that this book "has been written for the medical practitioner and the masseuse." It includes, he says, "descriptions of treatments . . . which a masseuse . . . should be able to give though she may have learnt slightly different methods. The treatments described . . . are based on the methods used at King's College Hospital." Practitioners who have no extensive physiotherapy experience will find the explanatory chapter which begins the book of great value. A section is devoted to crawling exercises, a study which Dr. Clayton has made essentially his own. An excellent series of photographs illustrate the text. The book, as a whole, is an epitome of physical treatment. The masseuse will find an indication of the broad lines she should follow, and the physician a fair idea of what he might prescribe. But there is a certain lack of precision in some of the statements. For example, anyone reading p. 96 might conclude that the iliac colon is frequently distended with fæces, while pp. 94 and 97 read together do not give a convincing account of the rationale of the treatment advised. The author expresses doubt whether electrical stimulation through the abdominal wall ever produces direct contraction of the muscles of the stomach or intestines, while three pages later he advises the application of faradic stimulation along the course of the colon for the relief of constipation. He advises that a case of empyema should be treated with breathing exercises as early as possible after the operation. He treats dislocation of the shoulder-joint by bandaging the arm to the side for two or three days, abduction being prohibited for a week after the accident. No guide is given as to the choice of splintage after injury. That the author has conservative views with regard to the use of physical treatment after fracture may perhaps be gathered from his advice that massage and movement will probably have to be delayed till at least three weeks after fracture of the surgical neck of the humerus.

This little book should be pleasurably read, for the wide range of physical treatment at his disposal is not sufficiently appreciated by the practitioner.

THE CHILD AND HIS PROBLEMS.

By ALICE M. HUTCHISON, M.D., M.R.C.P. London: Williams and Norgate. 1925. Pp. 168. 5*s*.

THIS book, which is introduced to the reader by Dr. Crichton Miller, is intended for parents and teachers. The factors which influence the development of the child are discussed in simple and homely language which should be comprehensible to a wide circle of readers. The author's standpoint is decidedly that of the environmentalist, and those who regard heredity as the major factor will not always agree with her views as to causation. Some, for instance, may regard the statement that "the difficult child is the product of his environment" as a half-truth of doubtful value, and that "he is absolutely certain to be transformed again into a normal child once he finds himself in the right atmosphere" as likely to cause some disappointments. Such criticisms as these, however, do not touch the main scope of the book, which is not theoretical instruction, but practical advice; the latter is sound and reasonable throughout, and its acceptance by parents should obviate a large measure of domestic discord.

SMOKE RINGS AND ROUNDELAYS.

Blendings in Prose and Verse since Raleigh's Time. Compiled by WILFRED PARTINGTON. Woodcuts by NORMAN JANES. London: John Castle. 1925. Pp. 320. 7*s*.

THIS compilation is dedicated to "A Thousand and One Nights spent over Pipe, Cheroot, and Cigarette with Many Good Friends, East and West," and comprises a large number of passages, many of them drawn from well-known literature, and all having the common design to exalt the humanising influences of tobacco. The excerpts are of varying literary merit, but their range will surprise many readers, for, while there are some poems and prose passages universally familiar, there are others which few will have remembered and many that will be new to most. The symposium introduces us to many new advocates of nicotine, whose praise is introduced

from many novel points of view. It is good to have brought together under the title of "A Pipe of Tobacco" the six imitations due to Isaac Hawkins Browne; they are often referred to and seldom seen in print. Both Mrs. Piozzi and Boswell testified to Johnson's admiration of this author, but it would seem from what is known of him that he could not smoke without drinking, and that in that connexion he smoked too much. A favourite passage from Thomas Carlyle's "Frederick the Great" is quoted wherein the sage points out that tobacco smoke is "the one element in which by European manners men can sit silent together without embarrassment, and where no man is bound to speak one word more than he has actually and veritably got to say"; this use of tobacco is very well known at committee meetings, where the man who is smoking is neither supposed to speak if he does not want to, nor expected to answer questions on the spot, as he has to attend to whatever he is smoking. He thus obtains time to make up his mind.

An amusing little book.

JOURNALS.

QUARTERLY JOURNAL OF MEDICINE.—The January number contains the following articles: Some Factors of Significance in Adolescent Goitre, by H. Gardiner-Hill, P. C. Brett, and J. Forest-Smith. A series of 100 cases of goitre occurring in patients between the ages of 10 and 20 years were the subject of this investigation. Of these, 79 per cent. were of a colloid type, 16 per cent. exophthalmic goitres, 3 per cent. adenomata, and 2 per cent. endemic goitres. The investigations included clinical observations, physical measurements, basal metabolism, and sugar-tolerance estimations. Thyroid function was found to be apparently normal in 42 per cent. of colloid goitres, but in 32 per cent. there was evidence of hyperthyroidism, and in 26 per cent. of hypothyroidism. The blood-sugar curves were delayed in both hyper- and hypo-thyroidism, and the blood-sugar content was raised in hyperthyroidism.—A Case of Virilism Associated with Suprarenal Tumour: Recovery after its Removal, by Gordon Holmes. The patient, whose case is here recorded, had a tumour arising from the cortex of the right suprarenal. It was found to be innocent, and nine years after its removal there was neither local recurrence nor metastases. The operation was performed when the patient was 26 years old. Her health had been normal until the age of 17, when menstruation ceased, and when 19 years old hair began to grow on the chin and upper lip. This was followed by a growth of hair on the legs, loss of feminine contour, and alteration in her mental state. Removal of the tumour was followed 36 days later by reappearance of menstruation, which had been absent for nine years, and by the return of her feminine physical and mental characteristics. A plate is included showing the microscopical appearance of the tumour, and for comparison those of a somewhat similar tumour which is preserved in the museum of the Royal College of Surgeons of England—a case recorded by Knowsley Thornton in 1890.—Epidemic Encephalitis: the Second Winnipeg Outbreak, by William Boyd. There have been two outbreaks of epidemic encephalitis in Winnipeg, one in 1919–20, and the other in 1922–23. Clinically, the former was of a somnolent and the latter of an excited type. A detailed description is given of the main features of the disease, and the special points of its pathology are considered. Acute calcification of the small arterioles of the basal ganglia was noted in young subjects, the larger arteries at the base of the brain being free from atheroma and calcification. The microscopical appearances of the calcareous deposits are shown in the two plates.—The Sugar Content of Blood in Normal and Under-nourished Children, and the Effect of Fat on the Absorption of Carbohydrate, by Muriel J. Brown. The blood-sugar content was studied in normal and under-nourished children. Using MacLean's method the normal blood-sugar in infants up to the age of 2 weeks varied between 0·072 and 0·097 per cent., and between the ages of 6 weeks and 1 year from 0·086 and 0·116 per cent. In conditions of under-nutrition the blood-sugar lay between 0·072 and 0·116 per cent. Whereas vomiting causes a fall in the blood-sugar level, it is unaffected by diarrhœa. Sugar-tolerance curves were also worked out and similar results were obtained in the normal and under-nourished child.—Progressive Lipodystrophy, by W. N. Boog Watson and W. T. Ritchie. Three cases of this rare condition are here described. No light can as yet be thrown upon its pathology. The characteristic features are well shown in the plates. The journal concludes with an account of the proceedings of the Association of Physicians of Great Britain and Ireland, whose eighteenth general meeting was held at Bristol in June, 1924.

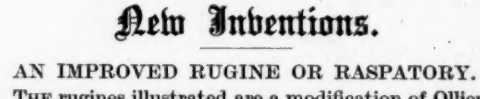
The Geographical Distribution of Exophthalmic Goitre in the British Isles, by J. M. H. Campbell. In this paper the author has amplified his work (*Quarterly Journal of Medicine*, 1921–22, xv., 64) on the distribution of exophthalmic goitre in England and Wales by including the figures for Scotland and Ireland as shown by the death returns in the Registrar-General's annual reports. The distribution of deaths from exophthalmic goitre in Great Britain and Ireland is indicated in two maps. One is divided into 11 areas, each with a population of 2,000,000 or over, and in the other the county boundaries are shown. It is seen that Graves's disease is especially prone to occur in the West of England and in the central part of Wales. The town incidence of Graves's disease is also discussed. With regard to endemic goitre there is very little accurate knowledge of its distribution in England, although certain parts are associated with it. On the evidence at hand it appears that in the British Isles exophthalmic goitre is more liable to occur in districts where simple goitre is endemic. On comparing the death-rate from Graves's disease with the birth-rate in different towns it was found that a low birth-rate is associated with a high death-rate from exophthalmic goitre, and vice versa.

New Inventions.

AN IMPROVED RUGINE OR RASPATORY.

THE rugines illustrated are a modification of Ollier's original pattern. The handles give a more comfortable grip than those of the original model. The shaft has been specially lengthened and the finger rests placed

FIG. 1.



near the handles so as to obviate the risk of accidentally introducing the fingers into the wound in plating and bone-grafting operations. The edge of the rugine is of razor-like sharpness. These rugines were copied from a pair devised by Major H. Pierpoint, I.M.S.,

FIG. 2.

and made under his direction at the War Hospital, Ambala, in the hospital workshop by Indian labour from materials available in the bazaar. I have found them invaluable in bone-grafting and bone-plating operations.

Messrs. Down Bros., St. Thomas's-street, S.E. 1, are the makers. H. HALLILAY, Lieut.-Colonel, I.M.S.

THE LANCET.

LONDON: SATURDAY, MARCH 21, 1925.

MEDICAL PARTNERSHIPS.

IN an action tried recently in the Chancery Division a medical man sought dissolution of partnership from a medical colleague upon grounds which, if they had been established, would no doubt have entitled him to succeed. The plaintiff's evidence, however, failed to make out his case to the satisfaction of the judge and the action was dismissed with costs, his Lordship saying that all the charges, and some of them were grave, preferred by the one partner against the other had been disproved. It was apparent to those of our readers who gathered the details of the case from the daily press that the ventilation of the dispute in public was prejudicial to the interests of both parties to it, and no doubt this consideration prevents similar actions from being tried, but no other course may be open to those who find themselves unfortunately linked together in the conduct of a medical practice. Some sort of an arbitration clause may be attempted, but, as occurred in the case referred to, it may not provide for the reference to an arbitrator of the points that are at issue. The dissatisfied party is then obliged to have recourse to Section 35 of the Partnership Act, 1890, which enables a partner in any kind of business to apply to a court of law for dissolution in various cases which include conduct such as "in the opinion of the court, regard being had to the nature of the business, is calculated to prejudicially affect the carrying on of the business, or when in matters relating to the partnership business a partner's conduct is such that it is not reasonably practicable for the other partner or partners to carry on the business in partnership with him." In the ordinary agreement between medical partners, a form of which will be found in "Barnard and Stocker's Medical Partnerships," arbitration upon any dispute touching the partnership is included, and we do not know whether this published form was used or not in defining the relations in this particular case. But, anyhow, the plaintiff's counsel found the arbitration clauses, if any, in the deed of partnership not to be full enough to render arbitration obligatory in lieu of the trial in open court which took place.

No one who is acquainted with the business side of professional life, and who knows the difficulties which surround the conduct of, and the arrangements for, medical partnerships, will be surprised that the deed of partnership was found ineffective. These difficulties may arise in ways that can hardly be contemplated in any uniform manner by those who draw up deeds of partnership, so that troubles occur which are not familiar to lawyers, and only vaguely guessed at by medical men, while it would seem that medical agencies have also much to learn in this direction. Therefore, regrettable though such legal actions as that which was recently tried are from some points of view, the publicity serves a good purpose in making all concerned careful about the terms of partnership to which they are asked to subscribe. There are situations, easily to be thought of, whose risks can, none the less, only be provided against with great skill in draftsmanship, while the mention of these risks might be considered as insulting and prejudice mutual good feeling at the outset. Perhaps such things as we have in mind may not happen often, but when they do they constitute a tragedy, incompatibility of temperament and outlook making of medical partnership a weakness instead of a strength, a farce instead of a contract. It may be granted that, as a rule, two or more fair-minded men can arrange so that the interests of their patients, which is another way of saying the proceeds of their professional work, shall benefit by collaboration and even by the personal contrasts which they may display. But where collaboration is impossible and partnership becomes a misery, the only way out appears to be a dissolution of partnership. Few deeds of partnership answer in a satisfactory way the crucial problem of who shall stay and who shall go, for it may be assumed that separation of interests usually implies separation of locality. Both partners may see that they had better separate, but each will consider that it is the other who should be paid out, while there is usually no arrangement by which the exact sum to be paid can be calculated. Nothing can constrain the partner who is reluctant to go to accept the sum of money that is offered to him, which in such circumstances is generally quite inadequate. And nothing can constrain the man who would pay his partner out to pay the right price, where the deed gives no basis for a detailed arrangement.

It would seem, therefore, desirable in deeds of medical partnership to have a full and explicit clause which would provide that all disputes, including those which arise out of quarrels or out of the alleged conduct of a partner, should be referred to an arbitrator. It might be desirable to state in the clause expressly that such an arbitrator should have power to dissolve the partnership, and to define the kind of arbitrator to be appointed as well as the manner of his appointment. In medical partnerships questions of the proportional return of premiums, of practice in the same neighbourhood, as well as questions of medical ethics and appropriate conduct, point naturally to the necessity for an arbitrator well acquainted with all the conditions of medical practice. The Court in the recent case, to quote the judge's words, "heard with some surprise that a life-long partnership was by no means unknown in the profession," but it is not an uncommon expression in partnership deeds.

SCIENTIFIC COPYRIGHT.

IN the history of scientific investigation there are not a few instances in which a research worker has seen others grow rich by the industrial exploitation of some discovery which he has made but from which he has been unable to derive financial profit. Should there not be copyright in scientific as in literary or artistic work? Nearly 50 years ago the law courts decided that the mere discovery of a natural law was not patentable; the chemical truth that pure sulphides will absorb the sulphur compounds was held not to be a proper subject-matter for letters patent; and we have hardly made much progress beyond that position to-day. Yet there is some encouragement in the recent report of the British delegates upon the general work of the Fifth Assembly of the League of Nations. The Committee of Intellectual Coöperation, it appears, has been requested to consult with the Economic Committee and to organise this year a conference of experts to consider recent proposals on the question of scientific property. The proposals referred to are those of

Senator RUFFINI, who has reported to the Committee of Intellectual Coöperation in terms discussed in an interesting article contributed by an American legal writer, Mr. E. S. ROGERS, to the recent issue of our learned contemporary the *Journal of Comparative Legislation*. Senator RUFFINI has been pointing out the injustice of our present system which recognises the two extremes of intellectual work, the base and the summit. The man who invents a new india-rubber heel can patent his invention and make his fortune. At the opposite end of the scale the musical composer who can give to the world a Ninth Symphony can secure the pecuniary profits which are his due. Between the two extremes is the worker in the field of scientific research who observes a truth from which mankind will derive immense and everlasting advantage: to him the law gives nothing. The Senator remarks that such a worker might be recompensed in either of two ways. He might be given the right to exploit his own discovery, but, since the gifts which bring success in the laboratory are seldom accompanied by those which bring fortune in the market-place, this privilege might be illusory. Alternatively he might be given the right to a sort of royalty on profits made by the industrial application of his discovery within a specified period, the suggested period being the discoverer's life-time and 50 years thereafter. As Senator RUFFINI suggests, the objections to recognising any legal right of the research worker in the creations of his mind may be expected to be exactly the same objections as were formerly raised against the claims of the artist and the inventor. Mr. ROGERS pleasantly develops the suggestion. He narrates the long campaign against literary copyright from the time of JOHN MILTON to the time of SAMUEL JOHNSON. He bids us prepare for just the same outcry against monopoly and the same enthusiasm for the interests of the people as DICKENS satirised in the speeches of Mr. GREGSBURY, M.P., to NICHOLAS NICKLEBY. "The creations of the pocket," said that great statesman, "being man's, might belong to one man or one family; but the creations of the brain belong to the people at large." Those who write for posterity should be content to be rewarded by the approbation of posterity; "anything put strongly about the people comes out very well at election times"; nobody need consider the feelings of the authors—"I believe the greater part of them live in lodgings and are not voters."

If history is going to provide a parallel between literary and scientific copyright, then the period of hostility will end in the ultimate recognition of the justice of the claim. The administrative difficulties of protecting scientific discovery will doubtless be formidable, but the task of protecting industrial inventions by the issue of letters patent must have seemed at one time equally impracticable and yet has not been found impossible. It would be rash to prophesy in what form the change of law will come. It may come in the form of a Convention on Scientific Property approved by the League of Nations after patient search for an acceptable formula. The English statute book has shown in the last few years that many legislative projects approved at Geneva are being incorporated in our law, especially, for example, in relation to regulating the conditions of labour. Or the change may come more gradually by the slow enlargement of the scope of patentable processes and methods. Signs of a movement in this direction are occasionally visible in Germany and elsewhere when the results of bacteriological work begin to be patented. By whatsoever means the change may come, it is hard to believe that in ten years' time the law will not ensure some measure of protection and recompense to scientific research such as it now gives both to artistic and literary work and to industrial inventiveness.

STUDIES IN COMPENSATORY HYPERTROPHY.

THE determination of what degree of functional derangement may be expected to follow definite organic lesions is difficult. There appears to be only a loose correlation between the bulk of an organ and the work it can perform. It is known, for example, that an animal can live in perfect health with only a quarter of the normal amount of renal tissue. Yet we have the curious anomaly that if one kidney is destroyed by disease the other tends to undergo a very considerable hypertrophy. V. R. KHANOLKAR's[1] work suggests that only limited areas of each kidney function simultaneously, and that the functioning areas shift continuously so that no part of the organ is overworked. In response to extra demands other areas become active, and in this way the kidney is capable of a wide range of activity. This probably explains the necessity for compensatory renal hypertrophy. But the principle cannot be of universal application, for as A. E. BOYCOTT and C. H. KELLAWAY have shown,[2] removal of one suprarenal gland is not followed by hypertrophy of the other.

PEYTON ROUS and PHILIP MCMASTER have published[3] some interesting observations bearing on the question of compensatory hypertrophy of the liver. It has been shown that three-quarters of the liver can be removed without causing more than temporary circulatory derangements, but rapid regeneration of the remaining quarter takes place till the original bulk of the organ is restored. If instead of ablation the circulation is diverted from part of the organ, the anæmic part atrophies and the remainder hypertrophies; and the changes take place concurrently so that at any particular time the total bulk of the liver is approximately that of the entire normal organ. Further, if compensatory hypertrophy is prevented in the unaltered moiety, atrophy fails to occur to any degree in the anæmic portion. It has been suggested that these curious phenomena are brought about in response to some functional demand of the body, and the question immediately arises, Which particular function of the liver is particularly essential to the body? Is it one or is it all of the normal activities of the organ which are so necessary?

In order to settle this question ROUS and MCMASTER repeated the experiments, using fasting animals so as to eliminate any functional stimuli due to the assimilation of food from the alimentary tract. Rats were the animals of choice for various reasons, one of the most important being that liver regeneration in them is extremely rapid, being complete in about two weeks. In rats receiving water but no food the liver diminishes in size to a remarkable degree; of all the other tissues, adipose tissue alone loses more weight. Two explanations for this have been suggested—one, that the liver is actually utilised as food; the other, that the loss in weight is due to a lessened functional demand due to the fasting. If the former explanation is correct, then compensatory hypertrophy after partial ablation of the organ should not

[1] Journal of Path. and Bact., 1922, vol. xxv., No. 4, p. 414.
[2] Ibid., 1924, vol. xxvii., No. 2, p. 171.
[3] Studies from the Rockefeller Institute for Medical Research, 1924, vol. i., p. 27.

occur if the animals are starved subsequently to the operation. But if the liver is really functionally necessary to the body, even though fasting, then some recognisable degree of compensatory hypertrophy should occur under the conditions of the experiment. Putting this to the test, ROUS and MCMASTER found that hypertrophy did, in fact, occur. They removed by operation more of the liver than persists in the starved but intact animal, and found that the fragment left did actually undergo hypertrophy. In the starving intact animal some of the liver is, no doubt, utilised as food; the fat and glycogen stored up in it are certainly mobilised for the purpose. But the main loss of bulk would seem to be due to the lack of normal functional stimuli from the alimentary canal. That stimuli exist, other than those arising from the digestion of food, is conclusively shown by these experiments. The exact nature of these stimuli is as yet uncertain, but it may be hoped that further work will clear up this important point.

Annotations.

"Ne quid nimis."

THE NEED FOR A NEW FACTORIES BILL.

THE conditions under which workers in factories are employed form one of the most important questions in our national life. Our present legislation with regard to factories is based on the Factories and Workshops Act of 1901, and although many progressive changes have been made under its powers, our industries, and indeed our whole social outlook, have developed and changed to such an extent since the beginning of the century that the need for new legislation has become an important issue. A year ago in these columns we published a series of articles on changing factory conditions, their rising standards and future developments,[1] in which we advocated the introduction of a new and comprehensive Factory Bill at the first good opportunity. Such a Bill was drafted when Mr. Bridgeman was Home Secretary, and received a first reading under the Labour Government. When that party went out of power Mr. Baldwin in his election address pledged himself to give the Bill a second reading, and mention was made of it in the King's speech. So far, however, nothing further has been done, but the new Bill does not lack enthusiastic support. On March 10th a deputation organised by the Industrial Bureau of the Young Women's Christian Association attended on the Home Secretary, Sir William Joynson-Hicks, to urge upon him the introduction and passing of the Bill. The deputation was composed of members of 28 societies, mainly women's organisations, and was representative of many different aspects of industrial and social life. The deputation was introduced by the Bishop of Winchester, the various speakers being Miss Gertrude Tuckwell, vice-chairman of the Bureau, Lady Ware, vice-chairman of the Executive Committee of the Conservative Women's Reform Association, Mrs. C. D. Rackham, late Inspector of Factories, a working woman whose name was withheld, and Miss Knight Bruce of the Industrial Christian Fellowship. The general aim of the measure to which it is sought to give effect is to amend the Act of 1901 and to consolidate with it eight other Acts which have been added to the Statute Book between 1901 and 1924—it simplifies while it combines the mass of existing factory legislation.

Among the features of the new Bill are the provison of a 48-hour week for protected persons as against a 60-hour week under the old Act, improved regulations in regard to safety, temperature, and ventilation, regulations regarding lighting, fire, and welfare, certification of the fitness of young persons, and weight-lifting by women and young persons. In reply to the deputation, the Home Secretary pointed out that the Government had also to consider the employers', the commercial, and the financial sides to the problem. He pledged himself that a Bill would be introduced into Parliament this summer to deal with factory legislation, but that Bill, he said, would not necessarily be the measure proposed by the last Government. There was no doubt that it would be a consolidation Bill, and it would also bring the position in regard to the safety and efficiency of factories very much farther than did any existing laws. Several debatable points still remained to be decided, particularly in regard to the regulation of adult hours of labour by Act of Parliament, and, he said, the Government would have to consider whether to include in a factories Bill a clause of such far-reaching importance as the regulation of women's hours of labour by legislation. He pointed out that while he did all he could to improve the position of the workers, he had to take care that he did nothing which would cripple our own industries in competition with the industrialists of other countries. The welfare of the workers has at least not been shelved, and we trust that the present Government will spare no pains to promote—to use the the pregnant word of the Home Secretary—the "efficiency" of our factories.

[1] THE LANCET, 1924, i., 304, 354, and 411.

THE INFECTIVE FILTRABLE VIRUSES.

THE difficulties inherent in work upon the infective filtrable viruses is known to all who have touched even upon the edge of the subject. That they are not of the sort which when faced flee away is obvious from the paucity of results attained to the present, in spite of the keen and unremitting work which is proceeding upon the subject in all parts of the world. Careful and painstaking attempts to isolate the virus of varicella are reported by Dr. Thomas M. Rivers and Dr. William S. Tillett from the hospital of the Rockefeller Institute.[1] By intratesticular inoculation of blood from patients suffering from chicken-pox into rabbits these authors were able to isolate a filtrable virus which they passed in series through nearly 70 rabbits. This they called Virus III. Although it never gave rise to any lesions clinically resembling those of varicella, it behaved in a definite and specific manner upon intratesticular, intradermal or intracerebral inoculation. Introduced by the first route it gave rise to pyrexia and malaise; intradermically it produced a characteristic local lesion, while on intracerebral inoculation it gave rise to histological appearances and clinical symptoms resembling those produced by the introduction of the virus of symptomatic herpes, but differing from this latter in never causing death. After inoculation by any of the above routes rabbits developed an immunity as demonstrated by failure on their part to show symptoms on subsequent inoculation. All these results appeared to point to the conclusion that in Virus III. Dr. Rivers and Dr. Tillett had indeed laid their hands upon the virus of varicella. In accordance with the high traditions of the Rockefeller Institute, however, these workers did not allow the matter to rest there. Further researches showed that the blood of patients convalescent from chicken-pox conferred no immunity upon rabbits against the virus. Finally, two healthy volunteers, one of whom had had chicken-pox and the other of whom had not, were inoculated in the arm with the virus. The subject who had never had chicken-pox developed no symptoms, while, on the other hand, the one who had had the disease, and was presumably immune against it, suffered from a severe disorder associated with malaise, fever, and swelling of the arm and regional lymph-glands, which took five days to subside. On the basis of their present data the authors are forced to the conclusion that Virus III. bears no relationship to clinical

[1] Studies from the Rockefeller Institute for Medical Research. Reprints, vol. ii., p. 325.

varicella. Where it came from and what, if any, is its bearing upon human disease is another and at present unsolved question. To the two filtrable viruses of which at present most is known—those of vaccinia and of symptomatic herpes—it apparently bears no relationship. In spite of these results, negative so far as varicella is concerned, the work of Dr. Rivers and Dr. Tillett is of the utmost importance, for they have succeeded in demonstrating yet one more of the filtrable viruses; how many more may exist and what are their relationships to each other and to human disease no one can yet even guess, but their nature and distribution is obviously a problem which cries out for elucidation.

In the same volume of studies from the Rockefeller Institute Dr. E. N. Cowdry and Dr. F. M. Nicholson make a further contribution having important indirect bearings upon this question. These authors show that in a certain proportion of supposedly normal laboratory mice encephalitic lesions are present in association with infection of the brain by a protozoan parasite. Attention has been drawn to this same phenomenon in the case of rabbits by a number of authors, including Da Fano in this country, within the last few years. A peculiar point, and one to make epidemiologists ponder, is that this widespread incidence of protozoan encephalitis affecting rabbits and mice in laboratories throughout the world is a new thing. The condition is known to have existed in 1921, but there is good reason to believe that it has appeared since 1917. It is apparent that not only the human mammal has been afflicted with new plagues in the last seven years.

SURGICAL HEADACHE.

THERE appear to be a certain number of headaches which are amenable to surgical treatment. The characteristic nature of such headaches is that they are usually severe, subject to exacerbations, increased by movement or excitement, and frequently limited to definite areas of the head. A. R. Campbell and C. K. Fuller[1] have recently drawn attention to this variety of headache which they classify as being due, with few exceptions, to pressure, inflammation, or the two combined. They point out that the principle of referred visceral pain, so thoroughly applied in abdominal surgery, should be extended to cover intracranial lesions. The symptom-complex of neuralgia, superficial tenderness, and segmental headaches should be looked upon as indicating some localisable intracranial lesion. They classify these segmental areas, which overlap to a certain extent, as frontal, temporal, vertical, parietal, and occipital, and for each of these situations is set out a list of lesions which may cause a headache. For example, the causes of a vertical headache are described under the headings of posterior ethmoid sinus disease, sphenoidal sinus disease, enlarged turbinates, deviated septum, middle-ear disease, depressed fracture, tumour, cyst or abscess at the base of the brain, pituitary disease, and aneurysm. In some of these lesions the headache may be unilateral or it may be universal, but headache from the same lesion is stated always to occur in the same situation in the same patient. Intervals of freedom from the pain may occur and it may only come on during certain times of the day or night. The application of adrenalin and cocaine to the nose may relieve the headache, indicating that nasal or sinus disease is the cause, and such headaches usually become worse during acute nasal catarrh. The use of the ophthalmoscope is advocated as essential in cases of severe continued headache, so that optic neuritis may be detected early, before irreparable damage has been done to the vision. It will be seen that the complaint of headache must very frequently come under the surgeon's notice, and Campbell and Fuller consider that there is need for greater emphasis being laid upon the differential diagnosis of this most common symptom.

[1] Canadian Med. Assoc. Jour., February, 1925, p. 144.

THE WORKMAN AND THE HOSPITAL.

IN the annual reports of hospitals which are just now being presented in such profusion to their supporters, nothing is more significant than the almost unbroken series of records of the success of workmen's hospital funds. Wherever they have been established they have almost invariably produced results that at the worst have been satisfactory, and at the best have been brilliant. It is a mistake to suppose that this method of bringing under contribution the classes which most frequently have resort to hospitals is something new, a product of the after-war crisis in hospital finance. These funds have, no doubt, greatly increased in number during the last few years, but a fair proportion of them have moved well into maturity. Thus the Workpeople's Hospital Fund at York was started nearly a quarter of a century ago. Last year it provided the York County Hospital with one-third of its income, and since it began it has contributed a total of nearly £60,000. This is merely one outstanding instance among many. All over the country we hear of "record" years of similar funds, of totals nearly doubled in 12 months, of the readiness of the artisan to take his share of the burden of maintaining the voluntary system. In more than 1600 places of business in Manchester and Salford there are penny weekly collections, and similar schemes are at work not only in many other large towns but in rural districts. Organisation and time are the two essentials of success—experience shows that enthusiasm is engendered without difficulty. In view of the vast amount of re-building and re-equipment which the hospitals, having, broadly speaking, surmounted their current difficulties, now have to face, these funds are certain to be of vital importance in the near future. They may not be able to provide the tens of thousands of pounds required for the provision of new wings, but they can, and do, act as splendid stimulants to the entire community.

VACCINATION AGAINST TUBERCULOSIS.

IT has long been the aim of many workers, and particularly of the French school led by Calmette, to obtain some method of vaccination against tuberculosis which should imitate in a scientific manner the natural process of vaccination by means of which so many individuals, inoculated by a small dose of tubercle bacilli in childhood, develop a complete and lasting immunity to the disease. Indeed, so effective is this natural process in the majority of cases that the fear has been expressed that if we completely stamped out bovine tuberculosis in this country we should remove the chances of this inoculating dose of tubercle bacilli from many children and tend to rear a race which would present a "virgin soil" to infection in later life with disastrous consequences. But the dose of bacilli obtained by the inge tion of dairy produce contaminated by bovine tuberculosis is very uncertain and for some children unfortunately proves fatal. Calmette has therefore devoted a long period of time to producing a type of tubercle bacillus which could be inoculated in a living form without giving rise to any local or focal lesions. After 230 successive cultures on a medium consisting of 5 per cent. glycerine potato and ox-bile, over a period of 13 years, he believes he has obtained a tubercle bacillus which is living but not "tubercul gène."[1] This bacillus, known as the bacillus-Calmette-Guérin (B.C.G.), is apparently avirulent, while it secretes a "normal" tuberculin. Weill-Hallé and Turpin[2] have employed the bacillus for vaccination since 1922 in 300 children born into tuberculous families. Following Calmette's teaching that the ingestion of tubercle bacilli is the principal mode of infection in the natural process, they give the B.C.G. by the mouth in doses of 1 cg. half an hour before food for three doses either on the third, fifth

[1] Calmette and others: Presse Médicale, July 2nd, 1924.
[2] Weill-Hallé and Turpin: Paris Médical, Jan. 3rd, 1925.

and seventh or the fourth, sixth and eighth days after birth. Treatment at this early age is important, for, according to Calmette, this method should only be used where there is no chance of previous infection with the tubercle bacillus. The device is usually employed where tuberculous parents refuse to be separated from their children. Of the first 178 cases, which have been closely followed up with monthly medical examinations, nine have died—a mortality rate of 5 per cent., and the remaining 169 continue to be well and healthy in spite of the fact that they are subject to constant infection in the home. In this country Eric Pritchard has reported somewhat similar work.[3] He has been using prophylactic injections of tuberculin at weekly intervals for the first six months of life in the case of infants born into a tuberculous environment. He has thus treated 40 cases during the past 13 years and all are alive and well, the eldest being 12 years old, although in each case either the mother or the father was suffering from active tuberculosis. It is obviously too early yet to estimate the value of such prophylactic measures, but the results both here and in France will be watched with interest.

TRADE DERMATITIS.

AN article on Lime Dermatitis by Dr. W. J. O'Donovan, which we publish on another page of this issue, calls attention to an interesting form of trade dermatitis—an important section of occupational disease. It is difficult to estimate accurately the extent to which trade dermatitis is responsible for attendances at clinics for diseases of the skin; it differs in different clinics according to the occupations followed by the local population, and variations in the figures given by different authors must occur. Lane [4] considers that from 4 to 5 per cent. of all patients admitted to the skin department of the Massachusetts General Hospital were suffering from lesions due to their occupation. Fordyce [5] gives 2 per cent. for his own clinic, but quotes H. H. Hazen, who considered that 20 per cent. of his cases were due to the patients' occupations. Frank Crozer Knowles,[6] in a review of nearly 25,000 skin cases, concluded that about 16 per cent. of all skin cases were due to the patients' work. MacLeod, in his textbook, "Diseases of the Skin" (p. 283), says, "a considerable percentage of the skin cases in adults in hospital practice are due to their occupations." He gives a list of 33 common occupations in which dermatitis is liable to occur, whereas Herxheimer [7] enumerates 74 trades provocative of eczematoid dermatitis, and the trades included in Prosser White's "Occupational Affections of the Skin" (second edition) must number well over 100. As would be anticipated from these figures, and as is confirmed by fact, new causes of dermatitis are constantly arising owing to the invention of new chemical processes or the modification of old ones. A comparatively slight change in a process may make a large difference in the incidence of dermatitis caused by it.

That a dermatitis is one of occupation may be easily missed in diagnosis, because many different agents produce a dermatitis superficially similar, or one resembling some common skin condition not regarded as due to an external irritant—witness the first case of lime dermatitis quoted in Dr. O'Donovan's article, where, in the original attack, the patient's trouble was diagnosed as seborrhœic. Secondary infections with staphylococci or streptococci are frequently superimposed on a dermatitis originally due to occupation and still further confuse the issue. Some types of trade dermatitis are, however, well marked and easily recognisable when once known to the observer; such are "chrome sores," "lime holes," "pitch skin," "tar acne," and "mule-spinners' cancer," whose names suggest their origin. The agents causing trade or occupation dermatitis are numerous, and many attempts to classify them satisfactorily have been made by different authors. They may, for instance, be divided into physical, chemical, and parasitic groups. The physical would include such causes as mechanical injury, wind, light, X rays, extremes of heat and cold, of dryness and moisture. The chemical group is by far the largest and requires much subdivision; it includes both organic and inorganic chemicals and the toxins of certain plants and trees. The parasitic group includes infections due to bacteria and fungi, and the attacks of animal parasites, such as mites. Causes coming under two or more of these headings may act together. The points of attack of the chemical irritants are almost invariably, in the first instance, the mouths of the hair follicles, the sebaceous glands, and the sweat pores, with, in addition, the natural furrows on the skin and any accidental abrasions. The maceration of the epidermis by the action of alkali materially increases the danger of attack by chemicals. In many industries certain workers seem to be naturally immune to the risks involved, others acquire an immunity, and it is important for all concerned for the employer to build up an immune personnel by the discharge of workers whose skins prove sensitive. In some cases, however, in workers who have appeared immune for years, the immunity breaks down under temporary ill-health or excessive exposure to the irritant. The treatment of trade dermatitis resolves itself primarily into removal of the patient from exposure to the irritant, and secondarily in protective or antiseptic treatment of the lesions, the possibility of malignant disease being remembered. The adage, "A stitch in time saves nine," applies with particular force to trade dermatitis, where early and accurate diagnosis is of such vital importance if the patient is to be speedily cured.

[3] Brit. Med. Jour., August 30th, 1924.
[4] Archives of Dermatology and Syphilology, 1922, p. 565.
[5] Jour. Amer. Med. Assoc., 1912, lix., 2043.
[6] Ibid., 1917, lxviii., 79.
[7] Deut. med. Woch., 1912, xxxviii., 18.

THE THERAPEUTIC ADMINISTRATION OF GLUCOSE.

CONSIDERABLE interest has been aroused by an article on the oral administration of large quantities of glucose, by Dr. T. Izod Bennett and Dr. E. C. Dodds, which appeared in THE LANCET of Feb. 28th. It will be remembered that these workers, impressed by the physical transformation often produced in diabetics by the administration of insulin, sought to ascertain whether improvement in the nutrition of wasting non-diabetic patients could be obtained by feeding them with glucose, possibly in association with injections of insulin. Benefit could not, of course, be anticipated if the ingestion of large quantities of glucose were found to give rise to corresponding glycosuria; but preliminary experiments on 15 normal volunteers showed that up to 500 g. of glucose in one dose could be taken without more than a trace of glycosuria. Clinical observations were then made on cases of acute infection, cases where hæmatemesis was the main symptom, and cases of marked undernutrition. Distinct benefit appears to have resulted from the addition of large quantities of glucose to their diet and no ill-effects were observed. The glucose used by the authors was commercial glucose (glucose B.P.), which they describe as a viscid syrup, prepared by the hydrolysis of Indian corn or other cereal starch with mineral acids. Glucose B.P. is guaranteed to contain less than two parts per million of arsenic; a number of samples from various sources gave negative reactions to Marsh's test. The cost of this commercial glucose is only about 6*d*. a pound, and when one pound is dissolved in a quart of water to which two lemons are added it makes a palatable drink. The price of this product is contrasted by the authors with that of pure glucose, which, they state, costs about 8*s*. 6*d*. a pound, whether in crystalline or anhydrous form. More than one of the large drug manufacturing firms have written to inform us that this statement stands in need of revision. The

large hospitals purchasing the substance in hundredweight quantities are able to procure it at less than half the price mentioned, while the rate even for small quantities is not much more than half this price. The statement that "pure glucose is little used save in chemical laboratories" has also been questioned, since apparently there is a demand for this product in considerable quantities from a large number of hospitals and public institutions. Commercial glucose is a heavy chemical; it is well known that the drug firms do not manufacture heavy chemicals and are therefore powerless to vary them or to control their composition. The difficulty of precise analysis of commercial glucose is admitted; it is not a single substance, but is a very variable mixture of glucose, dextrines, and other carbohydrates, and, according to one of our correspondents, it invariably contains objectionable quantities of sulphites. Pure medicinal glucose, on the other hand, is a fine chemical, manufactured by the fine chemical makers under rigid conditions of control, and the composition of it can be guaranteed. We are not convinced that the oral administration of the crude commercial product is likely to do any harm, but are glad to give publicity to the fact that pure medicinal glucose can be obtained cheaply by those who prefer to use a finer product.

PLAGUE IN THE ORANGE FREE STATE.

OUR South African correspondent states that the presence of plague in the Orange Free State is undoubted, and creating uneasiness. The Union Department of Public Health, in a bulletin published on Feb. 18th, reported nine cases in Europeans of plague in the Boshof district of the Orange Free State. Of these cases, four proved fatal. There was also one fatal case on another farm in the same district. The investigations carried out in the Boshof district by a health officer of the Department of Public Health have now resulted in the confirmation of the diagnosis of the disease being plague. A big campaign against plague, conducted along education lines, has been entered upon at Kimberley. It will embrace the extensive areas of Griqualand West, the Orange Free State, and the Cape Province. The Red Cross Society is coöperating with the Union Public Health Department to this end, and has placed a huge motor demonstration van at the disposal of the Department. Lectures and demonstrations are being given by Mr. Austin Roberts, of the Transvaal Museum.

THE PHILOSOPHER LOCKE AND THE UPBRINGING OF CHILDREN.

MODERN pedagogues hold that to spare the rod does not so much spoil the child as save him from a group of the more startling "complexes" that may dog his future. The attitude of many up-to-date instructors of infancy is not to impress upon the *tabula rasa* of the infant mind such forms and habits as appear proved by experience to be helpful, but rather to stand aside and watch a miracle unfold from within. Opportunities of studying the evil effects of the "impression" method have been given to many medical men, while no modern book of memoirs fails to bewail it in the interests of hero or heroine under the name of the "repression" method; a future generation will have to examine the results of a training by "expression." Meanwhile many parents of to-day stand bewildered.

That the subject is one of high interest to medical men was shown by the size of the audience which gathered at the social evening of the Royal Society of Medicine on Monday last to hear Dr. H. C. Cameron expound the views of Locke the philosopher. The philosophical and political achievements of Locke have to some extent obscured in the public mind the fact that he was an active member of the medical profession. In the intervals of writing metaphysical treatises, restoring the finances of this country after the great Revolution, taking a part in the foundation of the Bank of England, instituting reforms in the administration of the Poor-law, and assisting in the framing of the Constitution of the State of Carolina, Locke found time to conduct a successful general practice. Indeed, for such a life, as one of his biographers has remarked, there would be no better preparation than an acquaintance with the "fugitive and often equivocal phenomena of disease which resemble more nearly the phenomena about which metaphysics, ethics, and logic are concerned" than do the more precise investigations of physics or mathematics. That he was no mean surgeon also is shown by his treatment of that "imposthume in the breast" from which Pepys records Lord Ashley to have suffered in June, 1668. "He hath been fain to be cut into the body," remarks Pepys, and it was Locke who undertook this operation, sterilising the skin by free application of the cautery and evacuating what we now know as a hydatid cyst through a silver tube. When such a man as Locke turned his attention to the problem of the upbringing of children it might safely be assumed that his opinions would be worthy of note, and his little book on the subject went through 12 editions in some 50 years. He knew that crying babe who renders the night hideous, the neighbours furious, and the doting parents distraught. Crying, he observed, was of several sorts, but the worst of all was the "stomachful cry," the cry purposive, the deliberate attempt to disturb and distress the parent. Such children are invariably the offspring of parents who are most susceptible to the disturbing effects of such crying. It is remarkable how a child divines the weak point in its mother's armour and then seems impelled to keep on exploiting that discovery, like the insane patient who appears forced to wound most those whom he most loves and depends on. For excessive corporal punishment Locke had little use. Children are susceptible, earlier than we think, he said, to praise and commendation, and much may be done to mould them to the parent's will by a consistent attitude of pleasure or displeasure according as the conduct is right or wrong. Blows should only be administered when the child offers a challenge—what the modern psychologist would call a "power claim"—"the obstinate or stomachful cry should by no means be permitted," least of all should a hasty correction be allowed to end in such obstinate bawling, for then the good of the punishment would be all undone. Chastisement should be delivered calmly and with observation of its effect on the mind and brought to an immediate close when the child has been rendered pliant. "To put their bodies in pain without doing their minds any good is more cruelty than correction."

Locke knew also that older problem child, the subject of those familiar school reports: "Could do better," "Lacks concentration," and "Will not attend"—the child whose zest is choked by the consciousness of his failure at everything and his interest thwarted by the very eagerness of his efforts to attend. Locke understood and pointed out how hard it was for any to learn when pressed by strong emotion, such as fear. "It is impossible," he said, "to trace fair or regular characters on a trembling mind as it would be to trace them on a trembling paper." In this connexion Dr. Cameron recalled aptly the case of a surgeon, a friend, who brought to his consulting room a small son who did not progress at school. The surgeon began to appreciate the difficulties of the child's situation when it was suggested to him that a similar régime to that of the school might be introduced at his hospital; when the governors might summon him periodically to the board room, intimate that they were dissatisfied with his work, that the weekly lists of operation results showed his name invariably lower than that of his colleagues, that his marks for asepsis were consistently poor, and, as a final suggestion, that he might go to the hospital on Saturday afternoon and do 50 hernias as an incentive to future effort. The parable worked its effect.

PREJUDICE AGAINST WELFARE CENTRES.

UNDOUBTEDLY prejudice sometimes exists, generally in rural districts, against the valuable ministrations of welfare centres. It frequently takes the form of resentment by mothers against interference in behalf of their children, but the usual cause of friction between a mother and a welfare centre has its roots in the belief that a woman who has had children must know how to bring them up. Last week at Loughborough an unfortunate mother, at an inquest upon her child, in whose behalf the ministration of the welfare centre had been refused, defended her inaction upon exactly that ground, when the coroner told her that she had erred in relying upon her own judgment. The jury rightly returned a verdict of death from natural causes, but it is a little surprising that the benefits that can be derived from the systematic work done at welfare centres are not more immediately recognised. Undoubtedly some welfare centres are better managed than others, and now and again absence of tact on the part of some welfare worker may alienate the sympathy not only of those for whose use the centres have been designed, but of the medical men in the locality. Of such a situation, however, we do not hear often, and when it has been created it should be capable of quick remedy. And against the views of mothers who employ as proof of their experience the classic argument, "I've had six children and buried four," can be set the enlightened gratitude of very many homes.

AUGUST VON WASSERMANN.

FROM Berlin comes the announcement of the death, on March 16th, of August von Wassermann, whose name is so familiar in the medical vocabulary of the world. Wassermann was born in Bamberg, Bavaria, in 1866, and studied medicine in Munich, Strasburg, Vienna, and Berlin, obtaining his degree at the University of Strasburg in 1889. In Berlin he was one of Koch's pupils, and in 1891 became his assistant at the Koch Institute for Infectious Diseases (with which institution he remained associated throughout his entire career), and he was appointed as physician to the staff of the Royal Charité Hospital. In 1898 he obtained a titular professorship and settled at Berlin University as lecturer, being appointed ordinary professor in 1903. Four years later he was placed in charge of the University department for therapeutic and serum research, and in 1913 he became director of the Kaiser Wilhelm Institute for Experimental Therapeutics at Dahlem, near Berlin. Wassermann's great contribution, along with Neisser and Bruck, to medical science, the discovery of the complement-fixation test in syphilis which bears his name, was made in 1906, one year after Schaudinn had found the parasite of the disease. The value of this test has been enormous. The grounds upon which Wassermann and his colleagues based their experiments were rigidly scientific. In accordance with the observations of Bordet and Gengou they deemed it necessary to use as antigen an extract of syphilitic liver, and they assumed that a positive reaction meant the presence of specific antibody in the blood of the patient. But it was soon found that the specific antigen was unnecessary. An alcoholic extract of normal liver or heart, even from a guinea-pig, was found to serve just as well, and, indeed, solutions of known chemical composition—e.g., of lecithin and cholesterin—were proved capable of acting as antigen, and this without any impairment of the diagnostic value of the test. Thus the scientific basis of the reaction was shattered, but the test, interpreted empirically, did not lose validity. The investigation has since been taken up by biochemists, and it is possible that this serological problem may ultimately receive a physico-chemical explanation.[1] Syphilis was not the only field in which Wassermann conducted his researches. Early in his career, together with Ehrlich, he studied the antitoxin treatment of diphtheria, and he also did important work in connexion with inoculation against typhoid, cholera, and tetanus. Latterly he had been working on tuberculosis, and at the German Medical Congress in October, 1924, he reported on the possibilities of sero-diagnosis in cancer. A fluent and lucid writer and lecturer, Wassermann made many valuable contributions to scientific and medical literature.

[1] THE LANCET, 1920, ii., 78.

THE LONDON INSURANCE COMMITTEE IMPASSE.

IN THE LANCET of March 7th we reviewed an embarrassing situation arising from the withdrawal of the medical members from the deliberations of the Medical Service Subcommittee of the London Insurance Committee. The Subcommittee has been unable to obtain a quorum for three months and important work has been held up. At a special meeting of the London Insurance Committee held on March 14th the following resolution was carried:—

> That, in order to overtake the arrears of work existing at the present time and subject to the consent of the Minister of Health, the Insurance Committee for the County of London do constitute a second Medical Service Subcommittee to sit and act concurrently with the first, such subcommittee to be appointed purely as a temporary measure and in no case for a period beyond June 30th, 1925.

One of these subcommittees has as medical members Dr. H. J. Cardale and Dr. E. A. Gregg, as the representatives of the Panel Committee, and Dr. T. M. Ness, as the representative of the Local Medical Committee, and will function under the chairmanship of Mr. David Davis. The medical members of the other subcommittee are Dr. R. L. Bell and Dr. W. C. Goodden, representing the Panel Committee, and Dr. K. McFadyean, as the representative of the Local Medical Committee, and the suggested chairman is Mr. H. Mills. It is hoped that the appointment of a second subcommittee will mean that the accumulated work will speedily be dealt with.

THE delivery of the third Lettsomian Lecture by Sir Bernard Spilsbury has been postponed.

THE Wellcome Historical Medical Museum will be closed for cleaning and decoration from April 1st to April 30th inclusive.

DONATIONS AND BEQUESTS.—Miss Rose Esther March, of Leeds, left £21,000 for charities, including £2000 each to the Leeds General Infirmary and Leeds Maternity Hospital, £1000 Leeds Public Dispensary, £500 each Leeds Women's and Children's Hospital, Leeds United Institution for the Blind, Deaf, and Dumb, Leeds District Nurses' Institute, Church Army Home, Leeds, and several benevolent institutions.—Lord Bearsted has promised to give £10,000 for the provision of a new clinical theatre at the London Hospital. The income of the balance not required for the cost of the theatre to be used for purposes of research and the investigation of disease. Mr. Alfred Williams has also promised £10,000 in memory of his son, Owen, the income of this money also to be spent in the investigation of disease.—Mr. Robert Henry Carpenter, solicitor, Bristol, left £500 each to the Royal Infirmary and the Bristol General Hospital, and £250 to the Bristol Dispensary.—Mr. John Macfarlane, Brough, Yorks, left £1350 each to the Port of Hull Society's East Coast Mission and Sailors' Orphan Homes, and the General Infirmary, Perth, £500 to the Young People's Christian and Literary Institute, Hull, £450 to the Hull Infirmary, and £250 to Dr. Barnardo's Homes. After the fulfilment of other bequests, half of the residue of the property, which was of the gross value of £18,356, will go to the Hull Royal Infirmary.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CXIV.—THE TREATMENT OF SPRUE.

SPRUE, formerly, and, in fact, until comparatively recently, a disease of the tropics, is coming to assume an ever-increasing importance for medical practitioners in this country. Whether the disease ever occurs in an individual who has not at some period resided in the tropics is not certain, but in the same way as pellagra was found to exist in England, when it was looked for, so may it turn out to be in the case of sprue. Apart from this, however, patients return home from the tropics in large numbers on account of sprue; after apparent cure they relapse while at home, for, at all events, until recently, a sprue patient was always advised against returning to the tropics; and, lastly, cases undoubtedly occur where persons who have lived abroad enjoying good health begin to show symptoms of the disease months, even years, after they have retired and settled down at home. For these reasons it is important that the practitioner at home should know something about sprue, and, further, that the diagnosis of the condition should be based upon a sure foundation. This point is essential, since some of the symptoms present in true sprue, such as loss of weight and fatty diarrhœa, are found in other diseases, and also, a matter of greater moment, because recent, rational methods of treatment bring about a rapid and, so far as we can judge at present, a permanent cure if the case is taken in hand early—a marked contrast to what occurs under the older, empirical methods of treatment, which lead usually to temporary improvement only, with the risk of relapses and in many cases to death, with symptoms indicative of pernicious anæmia after a varying period of partial invalidism.

Empirical Methods.

The empirical methods of treatment most generally employed are as follows:—

Dietetic.—Some patients are kept on milk, at first solely, later chiefly, for weeks, and even months, and on leaving hospital are given a fairly rigid dietary, which they are warned against infringing at their peril. Others improve on the Salisbury treatment (hot water and scraped meat), being unable to tolerate milk in the quantities necessary to form the main article of food. Whichever line is adopted it is found that mixed diet in the early stages is not good. Others, again, pin their faith to liver soup, and some patients may even come to like it, but man cannot live by soup alone. It is, perhaps, given on the idea that bile is absent from the white frothy stools, and that the hepatic functions may be stimulated thereby. The "strawberry cure" must also be mentioned under this head. Well-to-do patients have been known to travel about from place to place in order to keep in touch with the fruit; poorer persons who have to stay in England take strawberries in season, then pass on to raspberries and next to loganberries and, when these can no longer be obtained, to bottled fruit and strawberry jam until the next crop is gathered. As the fruit constitutes only a small part of the dietary, its value in sprue cannot be accurately estimated.

Vaccines.—The administration of these is in some cases attended by good results; the rationale of this is explained later. That the organism cultivated is not the one causative of sprue as an entity is proved by the fact that different vaccines will in various hands produce equally beneficial effects—monilia, coliform bacilli, streptococci—while others record no benefit from the use of any of these.

Drugs.—Santonin was in considerable vogue for a time, but it was said to be a requisite that the drug must have been sent on a voyage to tropical countries in order that the white crystals might take on a brilliant yellow by exposure to tropical sunlight, otherwise it was ineffectual. It is now but little used, and is most uncertain in its effects. Emetine, also, has been, and is now, used in sprue, and some cases with sprue symptoms undoubtedly improve and even get well with it; in others it proves quite useless. Many sprue patients give a history of previous dysentery, and it is probably some residual effect of that disease which the emetine clears up, since dysentery is one of the conditions whose later symptoms may in some respects resemble sprue. Such cases as have come within the knowledge of the writer do not answer to the laboratory tests for sprue.

Calcium-Parathyroid Treatment.

The most recent form of treatment, based on the results of laboratory tests, is that by calcium and extract of parathyroid gland. This is, at least, founded on rational grounds and the progress and results of the treatment can be tested in the laboratory. The fatty diarrhœa, the cramps which are often present, the œdema and tetany seen in late and severe cases are some of the symptoms which may be ascribed to faulty calcium metabolism. The total calcium in the blood is, however, normal or very nearly so, hence absorption of calcium is little if at all interfered with. It has been shown that, normally, calcium is present in the plasma in two forms: some 6 mg. per cent. (i.e., per 100 c.cm.) being in what H. W. C. Vines [1] describes as the free or ionic form, and readily precipitable by its chemical equivalent of ammonium oxalate solution; the remainder, 4 mg. or a little more, is bound and requires, perhaps, three times its equivalent. This he calls the combined or coagulative calcium, since it is closely concerned with blood coagulation. Normally, when coagulation takes place, practically the whole of the calcium is found to be in the ionic form in the serum. In sprue, but in no other sprue-like conditions in which similar tests have been carried out, the ionic calcium in the serum is reduced, in severe cases, by as much as 30–40 per cent. Although absorption of calcium does not appear to be interfered with to any extent, since the total is within the normal limit, the regulation of this element is upset. By flooding the system with calcium, as by giving large quantities of milk, by the use of pulvis Bataviæ, by the administration of powdered cuttle-fish shell (as used in China), this deficiency is temporarily made good and improvement ensues, but, and this is the important point, the improvement is not stable. The regulator of calcium metabolism is believed to be the parathyroid glands, and this is borne out by the fact that if parathyroid extract is given in doses of one-tenth of a grain twice daily, the symptoms of sprue have been shown to clear up with marvellous rapidity. The ulcerative stomatitis may disappear in ten days or so, the diarrhœa is replaced by constipation, the colour begins to return to the stools in two to three weeks, the patient puts on weight, often 3 to 4 lb., sometimes as much as 7 lb., in a week by the end of a month, and his sense of well-being is restored.

The technique of estimating the ionic calcium by Vines's method is as follows: Blood is taken in a glass tube, about 1·5 to 2 c.cm., and allowed to clot. The serum, of which about 1 c.cm. is needed, is then separated and heated in a water-bath to 56° C. for an hour. The steps in the test are three: In the first, by adding fixed amounts, 4 vols., of various dilutions of ammonium oxalate to 10 vols. of fresh normal blood (usually that of the person carrying out the test) and placing the mixture in the thermostat at 37° C. for ten minutes, that strength of oxalate is found which just prevents clotting under the terms

[1] The Parathyroids in Relation to Disease, 1924, Arnold.

of the experiment. The next step is to find out, by adding 2 vols. of various dilutions of calcium chloride to fresh arrangements of the above mixture (4 vols. of the determined oxalate dilution and 10 vols. of blood), what dilution of calcium chloride just suffices to bring about complete clotting of the blood. The third step consists in carrying out tests similar to the last but replacing the calcium chloride solution by the same volume of dilutions of the patient's serum, prepared as previously described. By a calculation the calcium content of this serum is thus determined, and in normal subjects will be found to be somewhere between 10·4 and 11·4 mg. per 100 c.cm. In severe sprue it is about 6·5 mg., and after the treatment to be detailed shortly is begun, if this test of blood is carried out weekly, a steady progress is noted, till, at the end of four to six weeks, it is found to reach normal. The theory in part is that one of the actions of the parathyroid glands is to counteract intestinal toxins; that it carries on this work until the toxins are too great for it to cope with. Under these conditions, if the toxins can be reduced, as by careful dietetic regulation, the glands can recover and perform their function again, at least for a time. If, by good fortune, one of the chief causative organisms is isolated and a vaccine made, the administration of this may relieve the gland for a time, hence the good results of some vaccines in some cases and of other vaccines in other cases, as mentioned above; hence, also, the failure of vaccines in the hands of many, some other than the toxin-producing organism having been isolated.

The usual line of treatment by this most recent method is to put the patient to bed for the first 14 days, allowing milk only, beginning with 3½ to 4 pints a day, taken warm (not hot) with a teaspoon, at regular intervals, and increasing by ½ pint in the 24 hours, till at the end of the fortnight 7 to 7½ pints are taken daily. Calcium lactate is also given in cachets containing 15 gr. each, thrice daily, and parathyroid extract gr. 1/10 twice daily. It is absolutely essential that the extract be free from thyroid. If there is constipation a small dose of liquid paraffin is probably the best aperient. From the tenth day onwards some plain biscuits may be allowed, such as water biscuits or Mellin's food biscuits. By this time the ionic calcium has probably increased to between 7 and 8 mg. per cent., and gradual increase in food may be allowed and the patient permitted to be up for an increasing time each day. At the end of three weeks the patient, unless a very severe case or one of long standing, can take milk-puddings, eggs, fish, potato, carrot, bananas, and in the fourth week chicken and non-acid fruits. The calcium can be reduced in the third to fourth week and probably stopped altogether at the end of the fourth. The parathyroid extract should be continued in full doses till the fifth week, then reduced to half doses for a week, and in most cases further reduced until it in turn is stopped altogether at the end of six to seven weeks. This, however, can only be gauged with certainty by the blood test, and the drug must be continued until this shows that the ionic calcium has reached the normal.

It will be found that any return of symptoms, whether due to dietetic or other indiscretion, will be evidenced also by a fall in the ionic calcium, hence the enormous value of the test as a gauge of progress in this disease.

Though it is, perhaps, too early to claim permanency of cure, several of those who had been invalided home and forbidden to return to the tropics have, nevertheless, gone back and remained perfectly well, and equally good results have been recorded of patients treated in the endemic centres of the disease.

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Special Articles.

ROYAL COMMISSION ON LUNACY AND MENTAL DISORDER.

FURTHER SITTINGS.

(*Continued from p. 512.*)

THE Commission resumed its sittings on March 10th under the chairmanship of Mr. H. P. Macmillan, K.C.

Evidence of the Mental Hospitals Association.

Alderman J. G. Taggart (Liverpool) and Alderman Sir William Hodgson (Crewe) attended to give evidence on behalf of the Mental Hospitals Association.

Alderman Taggart said the body he represented wished to eliminate the element of pauperisation from lunacy administration, remarking that but for their mental illness less than 5 per cent. of the persons concerned would be pauperised. Cases of incipient insanity should be admissible to hospitals which were supported by the public health authority; mental illness should be provided for by public health authorities, in the same way as tuberculosis and venereal disease. These clinics would be in the nature of receiving houses, and would relieve the asylum population. It might need but little structural extension to existing hospitals. In each county, or in the less populous areas each two or three counties, there should be such a clinic, the present 50 per cent. grant for present clinics being extended to mental disorders of this nature. He suggested a modified form of provisional order, more on the lines of that required in the case of infectious diseases. Though himself a magistrate, he thought the governing authority should be medical. Also, in the matter of discharge, the medical superintendent's views should never be over-ridden by visiting committees; in one instance ten discharges took place under these circumstances, and most of those patients had to return.

Sir William Hodgson supported the idea of giving early treatment of mental cases in clinics. In the case of Cheshire, the proximity of Liverpool and Manchester would facilitate a smooth working of such a scheme. No man should be appointed a medical superintendent unless he had special psychological qualifications. To secure such diplomats was now much easier than it had ever been before. Owing to the depressing character of the medical work, he thought there should be interchange of service; also, there should be a shorter period of service for them, and the retiring age should be younger than at present. The administrative business of a mental hospital should be, in his view, entirely separated from the medical side of the work.

The Mental Treatment Bill.

The witness said that he approved of the general principle embodied in the Mental Treatment Bill. The Mental Hospitals Association had passed resolutions to that effect. That body considered that for a long time there had been necessity for such a Bill. It might have relieved many cases which in acute bodily illness were badly affected temporarily in mind.

The Chairman said he took it that Sir William Hodgson wanted to fill up the gap in treatment by some such scheme as that embodied in the Mental Treatment Bill, and the witness replied that this was so, but he disagreed with some of the machinery and methods proposed. He took exception, as did both the bodies he represented, to the clause dealing with the constitution of visiting committees, and particularly the provision for coöption. They said that these visiting committees should be strictly representative of elected bodies, as that was the only representation which was of value.

The Chairman pointed out that there might be persons interested in the welfare of the mentally afflicted and who were prepared to devote much time and work to the subject, and who, therefore, might be very useful in that branch of work.

Sir William Hodgson replied that that was always the argument used in favour of coöption. He had had much experience of coöption on public bodies, and he could not say it had been entirely of a satisfactory character. Some of the coöpted members were very enthusiastic persons, but in the promotion of the interests on particular lines the costs were not considered. As a rule, the most expensive members were the coöpted members. Moreover, these people were very easily approached by sympathetic appeals made on behalf of suffering people. Unless they had a full responsibility as to cost these appeals were, mostly, likely to succeed.

Lord Russell pointed out that coöption was a permissive function.

Asked about the influence of ladies as coöpted members, Sir William Hodgson said they had great powers of persuasion over the council.

Miss Symons asked whether one or two women were likely to persuade so many men, and the witness replied in the affirmative, remarking that he had often seen it done.

The Chairman suggested that the presence of women on these committees was very desirable as they had a better knowledge of household concerns and were probably better critics of administration, and he asked how they could be secured without coöption.

The witness replied that on most authorities women were now coming on in an elected capacity, and both his Associations agreed to women being included when they were elected by the ratepayers.

Lord Russell suggested that if there had been women on the visiting committee of Prestwich Asylum many of the criticisms of that institution might have been avoided.

The witness replied that he did not think he ought to be asked about Prestwich.

The witness was then asked his views as to the prosecution of research at asylums, and the line he took was that the impetus for research among workers in asylum laboratories ought not to be smothered by interference from the Board of Control or other central authority. He contended that the inventive discovering mind was of a peculiar type, and was not necessarily revealed in team-work. He favoured strongly giving asylums with well-equipped laboratories a free hand in their researches.

The Chairman suggested that the requirement of the approval of a central body would prevent unnecessary duplication of research and undesirable overlapping. It also might project research into one particular class of diseases in one centre and another in another centre, and not only avoid overlapping, but help to concentrate the work. The representatives of the ratepayers of a particular district in which an asylum was situated should have the power, he thought, to decide unhampered what researches should be carried out, as the ratepayers paid for it.

Sir Humphry Rolleston asked whether the Board of Control had exerted any action which was derogatory to research.

The witness answered in the negative, but said it was because they had not the power, and they were anxious to get that power.

Sir Humphry Rolleston then asked whether it was not an advantage to have the advice of the Board of Control, and their function of ascertaining what work had been done.

The witness said he did not think so. When the Association discussed the matter it said it was not in favour of having State grants if that would mean more control by the Board of Control. If it were said that there would be larger grants but more grip on the work being done, the attitude was "Take your grants, we would rather not have them."

The Chairman asked whether the witness's view was that there should not be interference, but some coördination, and the reply was, "We welcome advice, but we say the tendency is to be too much governed." He went on to say that the central body had done nothing for research.

The Chairman pointed out that the Board of Control had to deal with not only large up-to-date laboratories and asylums, but with places where the zeal was not so keen.

The witness replied that the Mental Hospitals Association was brought into being for the purpose of meeting and discussing the problems connected with the various asylums, and to deal with difficulties.

Asked as to his views on the appointment of district commissioners and inspectors, he said it was the multiplication table in the wrong direction.

Sir Humphry Rolleston asked whether the witness thought the Board of Control should be dispensed with.

Sir William Hodgson replied that he did not think anything he had said called for that question, but he would reply that he did not think they were doing any effective good work, and he would not be sorry to see the Board of Control scrapped.

The Chairman asked whether if the Board of Control were scrapped some other body should not be substituted for it, and the witness replied that he thought the committees elected and appointed by the people, if in direct touch with the people, would afford the best system of control. He agreed there should be central bodies directing and diffusing information, but when it came to controlling, he said "No."

On Wednesday the representatives of the British Medical Association continued their evidence. The following gentlemen attended: Dr. Langdon-Down (Chairman, B.M.A., Lunacy Committee), Dr. J. W. Bone, Dr. C. O. Hawthorne, Mr. E. W. G. Masterman, Dr. C. Murrell, Sir J. Verrall, and Dr. C. C. Lord.

The Position of the Licensed House.

The Chairman said he assumed that the objection, in principle, to this kind of institution which was held by some was, that it might possibly cause conflict between duty and interest on the part of the management. Dr. Langdon-Down said he thought that was the basis of the theoretical objection, but in the main the reports concerning those houses were by no means adverse. Critics probably overlooked some other considerations, such as the desire of people to do a good thing and do it well, and the great stimulus of maintaining a good reputation. Answering the Chairman's remark as to suspicion based upon large profits made by these institutions, the witness said he knew nothing of the profits, but he did not think there was justification for the suggestion of exploitation.

The Chairman said that in the case of persons in these institutions who were possessed of some means, the suggestion had been that there might be a motive on the part of relatives to keep them under detention, and that those running the institution might have a pecuniary interest in the same direction. Dr. Langdon-Down rejoined that if a thing was wrong it should not exist at all, but if it was right to have such institutions the supply should meet the demand. If the safeguards were adequate, the Association thought this kind of institution should be encouraged, though that body did not wish to fortify a monopoly as such.

Functions of the Medical Superintendent.

Dr. Langdon-Down, in answer to the Chairman, said he did not think the Association had discussed the point whether the superintendent's medical work was interfered with by his administrative duties. In his own view, all the circumstances and environment of the patient were involved in his treatment. He thought the supreme authority in an asylum

ought to be its medical superintendent. Mr. Masterman gave some of his experiences as medical superintendent of a Poor-law hospital of 800 beds.

The Question of After-care.

The witness said he thought it would be well if those concerned in the working of mental institutions were to take a larger share in the after-care arrangements, especially by habitual communication with the patient's doctors after the patient had left the institution.

Sir Humphry Rolleston asked whether the Association would support any scheme for social service connected with mental hospitals whereby cases might be visited afterwards by friendly people who were virtually on the staff of the institution. Dr. Langdon-Down said he did not see any objection to this, which would be a reasonable extension of after-care. His Association, however, had not considered the matter. Dr. Murrell hoped that if such a recommendation was made by the Commission the patient's consent should be necessary, as the patient and his people might not wish to be followed to his home. He agreed that, with such a proviso, the medical value of such a scheme would be great.

Treatment of Mental Cases at General Hospitals.

Dr. Langdon-Down said he thought some provision for early treatment of mental disorder in clinics—admitting in-patients as well as out-patients—might with great advantage be linked up with teaching hospitals. And these would afford instruction in mental disorder for those entering the profession. He thought there was a tendency to encourage mental departments in general hospitals. The Chairman said he thought some form of constraint would be necessary in such a case, and this might be resented by the general hospital management. The witness pointed out that at Utrecht, in the psychiatric clinic there, though the patients came voluntarily, they were detainable. He wished to say, in emendation of a statement he made when last he attended before the Commission, that there were several institutions for the treatment of mental conditions which were not actual insanity; among them being Chichester House, Maudsley Hospital, and an Edinburgh institution. Maudsley Hospital was a model of what might be done.

Protection of the Doctor Certifying.

Dr. Hawthorne pointed out the differences existing between a lunacy certificate and a certificate given in, say, a case of small-pox. In the latter the doctor offered himself as one willing to certify and do what was necessary in the matter; but in the other case the doctor was very reluctant to certify a person as a lunatic, and he acted as a public servant, while in the other case he acted in the ordinary pursuit of his profession.

The Chairman rejoined that the doctor was a professional man who held himself out as one who was able to perform certain things in which he was skilled, and that was the criterion on which he must be judged. He thought it was asking much that the Commission would recommend the certifying doctor to have the same protection as a witness who gave oral testimony in court.

Sir Jenner Verrall suggested that there was a risk that doctors might not be doing their duty if their protection in this matter were not increased.

LIVERPOOL: NEW HOSPITAL FOR WOMEN.—Plans for a new building, estimated to cost £120,000, are now before the joint committees of the Hospital for Women, Shaw-street, and the Samaritan Hospital for Women, who are coöperating in the appeal for funds which is about to be launched. The new hospital, with the additional accommodation so urgently required, will provide the most modern facilities, and along with the new maternity hospital should place the treatment of diseases peculiar to women on a very high level.

PROCEEDINGS OF THE ROYAL COMMISSION ON NATIONAL HEALTH INSURANCE.*

(Continued from p. 565.)

THE APPROVED SOCIETIES AND THE MONEY BENEFITS: CONTROLLER'S EVIDENCE—*(continued)*.

How an Approved Society may be Formed.

(App. B. 1–6.) Any body of persons may make application to become an Approved Society, and on receiving approval may undertake the business of National Health Insurance. Two principal conditions must, however, be complied with. The society must not be carried on for profit, and its constitution must provide for its affairs being subject to the absolute control of its insured members.

Types of Societies.

Though there are many varieties of Approved Society, they fall into two main classes—namely, centralised societies (societies with central government and without branches) and societies with branches, commonly called "affiliated orders." These branches are variously termed lodges, courts, or tents. Each branch is self-governing in nearly every respect provided it avoids serious mismanagement, and it is a separate and independent financial unit. Employers' provident funds are in another class and may be approved, even though the employer is entitled to representation on the committee of the society.

There are many varieties of type and organisation which may affect the quality of administration, the expenditure on benefits, and the financial results of Approved Societies. For example, the field of operation may be limited to a village, town, country, or wider area. The class of members may be restricted in respect of sex, occupation, religion, or social habits. The origination of the society may also determine the membership according to the peculiar traditions of the parent body—trade union, dividing club, coöperative organisation, or some kind of federation.

Numbers and Membership.

(App. B. 32–38.) The number of Approved Societies in England at the end of 1923 was just under 1000, of which 28 were societies with branches. The number of branches was about 6100. These numbers (societies and branches) are about one-half of the numbers approved at the outset. As to the number of members in any society, the variations extend from eight societies each with less than 50 members, to two societies each with over a million members, and one with approximately two and a quarter million members. Two and a half per cent. of the societies contain no less than 76 per cent. of the total number of members. The reduction in the number of societies has been effected mainly by a transfer of their engagements. (App. B. 61.) This has come about because the intricate provisions of National Health Insurance proved too much for many small and inadequately equipped societies; they were unable to compete with the more effective organisations; the smallness of their membership handicapped them in regard to initial and continuing expenditure on administration; inability to check improper claims for benefit led to excessive expenditure and further weakened their financial resources; and they were largely unable to find competent officers to carry on the business. (Q. 610–615.) Administrative failure has, therefore, been responsible mainly for transfers of

* In previous articles the proceedings of the Commission were reported under the following headings: Introductory Note; The Scope of the Insurance Scheme (see THE LANCET, Jan. 31st, pp. 247–8); The Provision of Medical Benefit (Feb. 7th, pp. 301–3; Feb. 14th, pp. 355–6; Feb. 21st, pp. 403–5); Financial Provisions of the Act (Feb. 28th, pp. 454–7); Medical Certification and the Regional Medical Staff (March 7th, pp. 508–9); The Approved Societies and the Money Benefits (March 14th, pp. 564–5).

References to the official statement which has been issued as an appendix in four sections are given thus: Section A, para. 69, is shown as "App. A. 69," and references to the oral evidence thus—Q. 1369.

engagements. No difficulty has been experienced in finding societies willing to take over what might be regarded as derelict concerns.

A Unique System.

(Q. 511–512.) The Controller agreed that the system of administration by Approved Societies is unique in this country, being essentially different from the systems in force in regard to Public Health, Poor-law, and Unemployment Insurance. The Insurance Act did not, however, set up an entirely new machine. In addition to creating some new organisations it grafted a scheme of State Insurance on the existing arrangements of Friendly Societies, Trade Unions, &c.

(Q. 515, 516.) As a general rule the great majority of insured persons take little or no interest in the government of their society.

(Q. 514.) I suppose that, even with the provisions for self-government contained in the rules, the control of societies, especially the larger societies, must necessarily in practice fall very largely into the hands of the officers?—That is true of certain societies and especially of the larger ones, but it is not confined to the larger ones.

Further, although in theory subject to the absolute control of their members, societies are of necessity guided and supervised to a large extent by the Department.

Sir Walter Kinnear was asked :—

(Q. 519.) What do you consider the relative merits and defects of the large and the small centralised society as regards efficiency, cost of administration, financial stability, and so on?—That is a very large question, and I am very anxious not to appear to bias the minds of the Commission as regards any particular type of society. I should prefer that the members of the Commission were left with entirely open minds on the subject.

(Q. 520–528.) The present system whereby numerous societies operate in the same town undoubtedly adds to the cost of administration. The following figures were given for six towns taken at random: In the city of Liverpool, 488 societies have members; in Bolton, 285; in Brighton, 304; in Norwich, 213; in Reading, 245; in Tynemouth, 168.

The Defects of Segregation.

By the system of water-tight compartments members of particular trades may be worse off than under a universal system of insurance. The Controller said :—

(Q. 543.) I am bound to say that as a result of the amount of segregation which has taken place, the problem of a certain number of the societies, composed largely of persons belonging to industries where the standard of health is not particularly high, is becoming rather a serious one.

Valuation.

(App. B. 153.) Societies and branches are required to be valued every five years by a valuer appointed by the Treasury. The process of valuation consists of a measurement of the value at the valuation date of future benefits and of future receipts from contributions, &c.

(App. B. 159, 160.) The accumulated funds of societies at the date of the last valuation were about £120,000,000. The valuation showed a net surplus of £17,000,000. (App. B. 178–9.) This amount must be distinguished from the disposable surplus, which it is the valuer's responsibility to determine. This amounted to £9,000,000, the balance of £8,000,000 forming a reserve which the valuers considered it important to maintain.

(Q. 796–7.) On the first valuation were the financial results much better than were expected; . . . will you explain broadly the reasons for this?—The chief contributory causes of the large surplus were, first of all, a low claims experience, especially during the period of the war; a high interest yield on investments; a high average of contributions received by societies during the period; and, as regards men's societies, a high rate of mortality among men during the war, which had the result of reducing the liabilities of societies and releasing substantial reserves.

The Controller said that the first valuation covered such an exceptional period that it would not be safe to draw any definite inference from it.

(Q. 803.) Do you expect the results of the valuation now proceeding to be as favourable as those of the 1918 valuation? Can you give us any approximate estimate of the expected surplus as compared with the 17 millions of the last one?—I understand that the results of the valuation now proceeding promise to be very satisfactory. But the Department has as yet received no reports from the Treasury valuers, and until we do so it is impossible for me to give you any figures.

(*Note.*—Since this evidence was given it has transpired that the new valuation is producing results even more favourable than the 1918 valuation.)

Sickness Experience.

(Q. 831–2.) The sickness experience on which the Act was based was the Manchester Unity experience of 1893–7. Partly because this was not up to date, sickness experience proved to be much less than expectation. The general view is that the standard of health of the people has greatly improved.

(App. B. 169.) As most societies do not impose any occupational restriction on their members, and even trade-unions and other similar Approved Societies are not always limited to members following exclusively any particular occupation, the records of societies cannot indicate with any precision, if at all, the sickness or invalidity experience according to occupation.

Additional Benefits.

(App. B. 180.) The disposable surplus may be distributed by societies in the form of prescribed additional benefits, of which there is a pretty wide range. They consist chiefly of increases in the normal cash benefits, in payment of the whole or part of the cost of dental or optical treatment, maintenance and treatment in hospitals or convalescent homes, medical and surgical appliances, provision of nurses, and other benefits of the same character (conveniently described as "non-cash" or "treatment" benefits).

(App. B. 185–190.) Of the £9,000,000 disposable surplus the proportion belonging to societies with head offices in England is £8,000,000. It is interesting to note that of this amount nearly three-quarters was applied in additional cash benefits, and one-quarter only in non-cash benefits. The societies had almost a complete discretion as to the way in which they should apply their disposable surpluses, and there appears to have been a general plumping for cash benefits, and, on the other hand, a considerable absence of uniformity both in regard to the scope of particular non-cash benefits, and as to the proportion of cost borne by the societies.

(Q. 880.) The benefits under the first valuation have been to some extent experimental, and there has been a danger of societies adopting a benefit without devoting enough money to it. The Controller said :—

We are very anxious that societies should not be allowed to adopt additional benefits for window-dressing purposes; that they should not be able to advertise that they are giving additional benefits for which the sum of money allotted is not sufficient to meet the normal application.

(Q. 883.) In connexion with the new valuation results, the Department will probably insist in regard, e.g., to dental benefit, on a uniform definition so as to avoid friction and misunderstanding.

Distribution of Insured Persons amongst Societies.

From the tables accompanying the Controller's evidence one very short extract follows. The membership of societies of different types for the whole of Great Britain was for the year 1920 :—

Type of society.	No. of members and percentage of total.
Friendly Societies with Branches ..	3,290,000 (22·7)
Friendly Societies (centralised) ..	3,451,000 (23·8)
Trade Unions	1,449,000 (9·9)
Employers' Provident Funds ..	120,970 (0·8)
Industrial and Collecting Societies ..	6,211,000 (42·8)
Total membership	14,521,970

It will be seen that nearly one-half of the insured persons are members of the Industrial and Collecting Societies. Of the total membership of all the societies about 9½ million are men and about 5 million are women.

SCOTLAND.

(FROM OUR OWN CORRESPONDENTS.)

Glasgow University.

Medical Benefactions.—The late Dr. John Hall, of St. John's Wood, London, who died in 1909, left the reversion of one half of his residuary estate to the University of Glasgow for the endowment of certain "tutorial fellowships" in medicine, surgery, and midwifery, and for the better equipment of practical teaching in these departments. The reversion has now accrued through the recent death of Miss Hall, the testator's sister, who has added half her own estate for the increase of her brother's benefaction. The whole endowment will amount to about £50,000; but some months must elapse before it is realised, and a scheme is formulated for its application. In view of the large clinical schools connected with the University at the Royal, Western, Maternity, Sick Children's, and other hospitals in Glasgow, the foundation will be a notable addition to the medical resources of the University.

The Gifford Lectures.—Dr. John Scott Haldane, F.R.S., Fellow of New College, Oxford, has been appointed Gifford Lecturer at Glasgow for 1926–27.

Zoology and the Medical Curriculum.

Prof. J. Graham Kerr made some interesting general remarks on this subject at a recent meeting of the Glasgow Royal Medico-Chirurgical Society, with Prof. Archibald Young, the President, in the chair. It was now generally recognised, he said, that zoology was one of the important basic sciences in the training for medicine. Perhaps the most important object of the zoological course was the training in biological method—which was the method used later on in the general work of the practitioner. It was not the method of the "exact" sciences, consisting mainly of measurement and calculation, but rather the method used in early childhood when by far the greater part of the mental development took place. In ordinary school training this method was excised and in its place was put training in the gulping down without question of information served out by the teacher. The result was apt to be disastrous to the development of the powers of observation and reasoning upon observation, and to undo this harm and to develop further these powers was the greatest function of the introductory zoological part of the curriculum. Emphasis was laid upon the special importance of drawing as a means of developing the scope of observation. The part played by the course in zoology in leading up to courses in anatomy, physiology, and pathology was emphasised, and Prof. Kerr concluded by accentuating the importance of turning out the fully qualified practitioner at the end of his curriculum as a naturalist who would view the problems before him with the eye of the naturalist. Many of the greatest triumphs of medicine in the past—the solution of such problems as inflammation, malaria, yellow fever—had been reached by tackling particular problems as problems in natural history, and who could doubt that the same would be the case in the future?

The Expectation of Life in Glasgow.

At the closing ceremony of the winter session of Anderson's College of Medicine, Glasgow, on Thursday, March 12th, Captain Walter Elliot, M.P., Parliamentary Secretary to the Scottish Board of Health, gave an address on the prevention of infectious diseases and the direction in which we may look for advance in this field of public health. During the past century, he said, preventive medicine had achieved some of the greatest triumphs that any department of science had ever been able to place to its credit. The problems it had had to face and solve were created by the great development of urban life. In illustration of this he mentioned that between 1801 and 1851 the population of Glasgow had increased by 346 per cent.—that is to say, from a population of 77,000 to one of 345,000. Another 650,000 came in the second half of the century. The first quarter of a million was accompanied by a tremendous increase in the death-rate, but the last 600,000 was accompanied by an equally striking decrease. In the years 1821–27 the expectation of life of a 10-year old boy in Glasgow was 42 years, while from 1832–34 it had fallen to 37 years. It was not until 1881–90 that it came up above what it had been in the 'twenties of the century, and it then had risen to 44 years. At the present time the high-water mark was 50¾ years. With regard to an elderly man the Biblical three score and ten still ruled, but the conservation of life applied to many who formerly died off in early manhood or womanhood. Even as late as 1870, of 1000 boys in Glasgow, half of them were dead by the age of 25, while of the same number to-day half of them were still alive at the age of 58. Put in another way, the present population of Glasgow would live 20 million years more than a similar number half a century ago, and the increase of the life capital of Glasgow was estimated at 1000 millions sterling. That, said Dr. Elliot, was a very great achievement for preventive medicine, not only in the humanitarian but in the economic field.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Royal College of Surgeons in Ireland.

THE Charter Day dinner of the Royal College of Surgeons in Ireland was held on Saturday, March 14th, in the hall of the College, when Mr. R. C. B. Maunsell, President, presided over a company of 100 Fellows and their guests. Lord Glenavy, Chairman of the Senate, was principal guest, and responded to the toast of "The Governor-General and Prosperity to Ireland," the Governor-General himself being unable to be present. Among other guests who spoke were the Provost of Trinity College and Mr. Justice FitzGibbon.

Honorary Degrees at Dublin University.

The Senate of Dublin University met last Saturday to consider graces for certain honorary degrees. Among those approved by the Senate were graces to confer the honorary degree of D.Sc. on Sir Frederick G. Hopkins, of Cambridge, and the degree of M.Ch. on the famous Americans Dr. G. W. Crile and Dr. Charles Mayo.

Medical Men Elected to the Dail.

His many friends have welcomed the return of Mr. T. Hennessy, F.R.C.S.I., as deputy for the South Dublin City constituency, by an unexpectedly large majority. He polled some 5000 votes more than the combined poll of his two opponents. Mr. Hennessy has been honorary secretary of the Irish Medical Committees for many years, and his presence in Parliament should be of service to the profession. In a bye-election in Cavan last week Dr. O'Reilly was elected.

Mercer's Hospital.

Every year one or more of the Dublin hospitals has to make its special appeal for funds to enable it to carry on its work. Last year it was Sir Patrick Dun's Hospital and the Royal City of Dublin Hospital. This year Mercer's Hospital is before the public. Last week a meeting of its friends was held in the hospital to make its needs known. The chair was occupied by Lord Glenavy, a governor of the hospital, and the Governor-General was present. It was stated that recently a new system of heating had been installed, and a new X ray apparatus had been purchased. These changes had not been undertaken until they were necessary, and further changes would soon compel the governors to further expenditure.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Experimental Syphilis.

THE Institut Pasteur of Paris has extended a welcome to two Argentine scientists, Drs. Jaurégui and Lancelotti, to enable them to continue the experimental researches on syphilis in llamas at which they have been working for the past 12 years. Arrangements have been made for the transport from Bolivia to Paris of a number of llamas, some of them vaccinated and others entirely untouched. The two doctors have discovered that syphilis develops in the llama on the same lines as in man, but with much greater rapidity, and completes its course at the end of three years by causing serious nervous symptoms which have a fatal issue in a few days. A culture of the specific organism has been prepared in human serum under anaerobic conditions, and after gradual attenuation by heat this culture has been used to vaccinate the experimental animal. From the animal thus immunised it has been possible to prepare a serum which cures the primary and secondary stages of syphilis in the llama. The cure is complete in a few weeks, and is verified by the fact that at the end of four months the animal is again liable to contract the disease. Although at present vaccination has produced temporary effect only and must be repeated after a time, nevertheless the serum does effect a definite cure. Animals treated in this way over seven years ago have remained absolutely free of infection. Encouraging results have already been obtained in human subjects, but the proof of time is still necessary, and the experiments require further rigid control. The existence of syphilis in llamas is of interest in relation to the old legend that the disease was first brought to Europe by the discoverers of the Americas.

The Function of the Larynx.

Dr. Marage, of Paris, demonstrated recently to the Academy of Medicine the results of experiments he conducted to determine the precise rôle of the larynx and the mouth in the formation of vowel-sounds. In his first experiment he occluded the mouth by filling it with the substance which dentists use to take impressions of the buccal cavity; under these conditions he found that the subject could pronounce the five fundamental vowel sounds perfectly. In his second experiment he found that if the larynx of a chloroformed dog were removed, the organ remained alive for a few minutes. If the various muscles were made to contract by the application of an electric current, and if at the same time a blast of hot moist air were passed through the larynx, the noise of barking was produced just as if the animal were alive. The whole organ changed its shape at each note. Therefore the larynx alone, apart from the mouth, can produce these vibrations. Finally, in order to investigate the actual working of the larynx, he obtained a cinematographic picture of the vocal cords. This film enabled him to demonstrate the vocal cords very clearly to his audience, and further permitted a detailed study of the vibrations of the cords, their changes in length and breadth, and the variations in the shape of the larynx during phonation.

Memorials to Two Surgeons of Lyons.

Two monuments were unveiled in the large amphitheatre of the Faculty of Medicine of Lyons on Sunday, March 8th, in memory of two great French surgeons who had lived and worked in Lyons. The one, Poncet, was for 30 years a distinguished Lyons surgeon; it is to him that we owe the conception of tuberculous rheumatism, the existence of which he supported energetically and persuasively, particularly before the Academy of Medicine. The other, Jaboulay, was his pupil, a skilful operator who did important work in the surgery of the nervous system. Among the speech-makers at the ceremony were Prof. Lépine, Dean of the Faculty of Medicine of Lyons, Dr. Jean Louis Faure, of Paris, in the name of the Academy of Medicine and of the Société Nationale de Chirurgie, and Dr. Lerich, of Strasburg, one of Poncet's former pupils.

The Danger of Radio-active Substances.

The Academy of Medicine has had under consideration the danger involved in the handling and transport of radio-active substances, and as a result recently made the following recommendations: (1) That the industrial preparation, handling, or transport of radio-active substances be classified among the noxious trades, not as regards the neighbourhood of the factories, but from the point of view of the workers; and (2) that strict supervision of the hygienic conditions obtaining in such establishments be instituted, together with suitable rules and regulations, on the findings of a scientific and technical commission.

RUTHERFORD MORISON TESTIMONIAL.

THE following is the second subscription list for the Rutherford Morison Testimonial Fund, the inauguration of which was announced in THE LANCET of Jan. 17th, p. 146:—

£25.—Mr. G. W. Richardson, Keswick; Mr. S. S. Whillis, Newcastle.

£10 10*s.*—Drs. Baigent and Hutchinson, Northallerton; Dr. J. J. Campbell, Newcastle; Dr. J. Charles, Stanley; Mr. J. Clay, Newcastle; Dr. W. S. Dickie, Middlesbrough; Dr. A. Duke, Newcastle; Dr. C. W. M. Hope, London; Lieut.-Colonel A. H. Proctor, Darjeeling; Dr. Fred. Proud, Newcastle; Mr. S. Raw, Sunderland; Dr. W. L. Ruxton, Newcastle.

£8.—Dr. G. W. Pailthorpe, London.

£5 5*s.*—Dr. H. H. Aitchison, Wallsend; Dr. J. Anderson, Seaton Delaval; Dr. W. D. Arnison, Newcastle; Dr. V. F. Badcock, Cornhill-on-Tweed; Dr. J. Bannerman, Stanhope; Mr. James Berry, London; Dr. H. S. G. Boswell, Hartlepool; Dr. C. E. L. Burman, Ladysmith, Natal; Dr. Mabel Campbell, Newcastle; Dr. W. S. Campbell, Sidmouth; Prof. Sir David Drummond, Beal; Mr. Horsley Drummond, Newcastle; Dr. H. A. Fielden, Torquay; Dr. Garson, Sacriston; Dr. J. C. Hamilton, Sunderland; Mr. J. Hamilton-Barclay, Newcastle; Mr. N. Hodgson, Newcastle; Dr. J. A. McLeod, Alnwick; Dr. S. D. Metcalfe, Newcastle; Dr. H. B. Ord, South Shields; Dr. H. W. T. Russell, Trimdon Station; Dr. T. Russell, Trimdon Grange; Dr. W. Seymour, Newcastle; Dr. J. S. Taylor, Vryheid, Natal; Dr. R. Walker, Wooler; Dr. R. J. Weidner, North Shields; Dr. J. Whyte, South Shields; Surg.-Comdr. F. G. Wilson, R.N.

£5.—Dr. E. Davison-Smith, Whickham; Dr. Ruth Nicholson, Liverpool; Mr. A. S. Percival, Newcastle (second donation); Dr. Olive Wilson, Newcastle.

£3 3*s.*—Dr. N. R. Beattie, Walker Gate; Dr. E. C. Braithwaite, Warri, Nigeria; Dr. H. P. Bennett, Newcastle; Dr. Craven, Bensham; Dr. A. J. Dale, Worcester; Dr. W. H. Dickinson, Newcastle; Dr. A. Fairlie, Blyth; Dr. J. Gilmour, Newcastle; Dr. Harland, South Shields; Dr. S. McCoull, Wylam; Dr. Angus Martin, North Shields; Dr. E. Farquhar Murray, Newcastle; Dr. G. R. Murray, Manchester; Dr. G. R. Newsome, Manchester; Dr. J. C. Norman, Hebburn; Dr. Freda Ramsay, Beckenham; Surg.-Comdr. B. Robson, H.M.S. *Princess Margaret*; Dr. H. L. Rutter, Newcastle; Dr. W. Simpson, Newcastle; Dr. J. Swanberg, London; Mr. G. Gordon Taylor, London.

£2 2*s.*—Dr. T. Aitchison, Willington Quay; Dr. M. A. Archdale, Ryhope; Dr. T H. Bates, Newcastle; Dr. Frank Beaton, Ashington; Drs. W. A. and E. G. Benson, Stanley; Dr. J. S. Brogdon, Hartlepool; Dr. J. R. Burn, Easingwold; Dr. A. Campbell, Heaton; Lieut.-Colonel T. T. Coates, Woolwich; Dr. H. Crichton, South Shields; Dr. H. I. Daggett, Boroughbridge; Dr. T. Dixon, Earsdon; Captain H. H. Elliott, Bombay; Dr. Anne Fairweather, Birmingham; Dr. Gardner, Darlington; Mr. W. A. Hewitson, Newcastle; Dr. W. Holmes, Ponteland; Dr. M. Jacobs, Hull; Dr. Lillie Johnson, Jarrow; Dr. Leishman, Barnard Castle; Dr. J. Macfadyen, Newcastle; Dr. D. R. MacGregor, Wallsend; Dr. McCullagh, Bishop Auckland; Dr. T. W. Maddison, London; Dr. W. Martin, Newcastle; Dr. D. M. Millar, Felling; Dr. I. M. Pirrie, Maldon; Mrs. E. Pirrie, Maldon; Mr. F. W. Ramsay, Bournemouth; Dr. Margaret Ranken, Sunderland; Dr. N. R. Rawson, Whitley Bay; Dr. D. R. Roberts, New Tredegar; Dr. R. Sanderson, Maryport; Dr. A. F. Bernard Shaw, Newcastle; Dr. Sparks, Whitley Bay; Dr. F. S. Walker, Newcastle; Dr. N. B. Walley, Dudley; Mr. C. Hamilton Whiteford, Plymouth; Dr. G. S. Woodman, Baghdad.

£2.—Dr. S. Louise Rook, Bradford; Dr. L. H. Walker, Dinnington; Dr. Edith S. Williamson, Newcastle.

£1 1*s.*—Dr. E. C. Abraham, Wolston; Dr. A. Angus, Tynemouth; Dr. F. Barrow, Rothbury; Dr. J. L. Blandford, Henwick; Dr. H. C. Broadhurst, Hebburn; Surg.-Comdr. H. M. Braithwaite, H.M.S. *Valiant*; Dr. M. Brennan, Gateshead; Dr. J. F. Bridge, Leamington Spa; Dr. Brown, Newton Abbot; Dr. J. Ferens Coltman, London; Dr. Corben, Cheam; Dr. Hedvig K. Cyriax, Nuneaton; Dr. H. G. Dodd, Hove;

Dr. Dougall, Gateshead; Dr. W. A. Elliott, Southampton; Dr. A. L. Fairlie, Cowpen; Dr. C. F. Fairlie, Blyth; Dr. H. E. Fellowes, Newcastle; Dr. W. Gibbons, Gateshead; Dr. Gilbert, Gateshead; Dr. J. E. Gofton, Paignton; Dr. W. Graham, Linthorpe; Dr. John Gray, Stanhope; Dr. Barbara N. Grinling, Newcastle; Dr. F. W. Gunn, Ashington; Dr. Helen Gurney, Newcastle; Dr. W. Hall, Sacriston; Dr. Norah Hamilton, Sunderland; Dr. A. S. Hedley, Rothbury; Dr. L. F. Hemmans, Lewisham; Dr. C. J. Henderson, Lancaster; Mr. J. P. Higham, Middlesbrough; Dr. R. S. Hindmarch, Gateshead; Dr. M. Hunter, Ferryhill; Dr. R. Hunter, Brampton; Dr. G. E. Hyden, Blackhill; Dr. J. A. Kendall, Brixton; Dr. H. Kerr, Newcastle; Dr. H. H. Laurence, Shotton Colliery; Dr. F. S. Leech, Gateshead; Dr. H. L. de Legh, Shincliffe; Dr. D. J. Lewis, Machynlleth; Dr. F. J. Lidderdale, Cheltenham; Dr. W. G. Lidderdale, Cheltenham; Major W. E. C. Lunn, Netley; Dr. G. McCoull, Prudhoe; Dr. J. R. McCurdie, Middlesbrough; Dr. McElroy, Blackhill; Dr. Mackenzie, Consett; Dr. H. E. Mather, Pemberton; Dr. N. A. Martin, Tunbridge Wells; Dr. F. W. Melvin, Oswestry; Dr. Jean M. Morton, Nottingham; Dr. S. E. Murray, Leicester; Dr. H. Newsome, Pill; Dr. D. F. O'Kelley, Boldon Colliery; Drs. MacRae and Raine, Corbridge; Dr. S. Phillips-Bedson, London; Dr. T. Brice Poole, Westcliff-on-Sea; Dr. Smallwood, Gateshead; Dr. A. Smith, Swalwell; Dr. J. L. Spiers, Gateshead; Major T. W. Stallybrass, Hounslow; Dr. Russell Steele, London; Dr. J. B. Tighe, Stannington; Dr. Dorothea M. Tudor, Leamington Spa; Dr. W. A. Tweddle, Newcastle; Dr. W. Vincent, Sheffield; Dr. Olivia N. Walker, Plymouth; Dr. G. W. Weir, South Shields; Dr. J. Whillis, Gosforth; Dr. A. F. Wilkin, Yarm-on-Tees; Dr. H. A. Wilson, Newcastle; Dr. W. Q. Wood, Edinburgh.

£1.—Dr. Soliman, Birmingham.

10*s.* 6*d.*—Dr. Christina Barrowman, Newcastle; Dr. R. E. Brown, Willington; Dr. Craig, Dudley; Dr. H. W. Eyres, Richmond; Dr. T. M. Kimpster, Gateshead; Dr. N. C. Leinard, Bristol; Dr. G. H. Lowe, Middlesbrough; Dr. H. H. Maidlow, Ilminster; Dr. Moore, Gateshead; Dr. H. Munro, Nettlesworth; Dr. E. R. Pantcheva, Buckhurst Hill; Dr. M. Scoresby-Jackson, London; Dr. Weldon Watts, Newcastle.

10*s.*—Dr. Florence B. Lambert, London; Dr. J. W. Sandhoe, Broad Clyst.

5*s.*—C. F. D. H.

Subscriptions promised, but amounts not specified.—Dr. Modlin, Sunderland; Dr. Norris, Gateshead; Dr. W. Smith, Gateshead.

The sum of £1143 7*s.* has been subscribed to date. The Committee has decided to close the Fund on March 31st, until which date subscriptions may be sent to the hon. secretary and treasurer, Mr. R. J. Willan, at 9, Kensington-terrace, Newcastle-upon-Tyne.

The Services.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt. (D) G. W. E. Holloway to be Surg. Lt.-Comdr. (D).

ROYAL ARMY MEDICAL CORPS.

Maj. and Bt. Lt.-Col. C. W. Holden to be Lt.-Col., vice Lt.-Col. J. Dorgan, to retd. pay.

Capt. T. V. Oldham retires, receiving a gratuity, and is granted the rank of Maj.

The undermentioned Capts. retire: H. G. Dresing, receiving a gratuity; J. B. Williamson, on account of ill-health.

SUPPLEMENTARY RESERVE OF OFFICERS.

H. L. Oldershaw to be Lt.

TERRITORIAL ARMY.

2nd Lt. K. V. Milburn (late R.F.A., T.F.) to be Lt.

ROYAL AIR FORCE.

Flight Lt. A. F. Rook is promoted to the rank of Squadron Leader.

Group-Capt. N. J. Roche is placed on half-pay, Scale A.

INDIAN MEDICAL SERVICE.

G. J. Smith to be Capt.

C. A. Bozman, A. Rosenbloom, M. P. Conroy, W. Scott, S. C. H. Worseldine to be Lts.

The King has approved the retirement of Lt.-Col. A. E. Walter and of Maj. J. H. Horne (on account of ill-health).

MENTIONED IN DESPATCHES.

The names of the undermentioned officers of the Indian Medical Service have been brought to notice for distinguished service during the operations in Waziristan, April 21st, 1923, to March 31st, 1924: Capts. T. R. Birmani, C. M. Ganapathy, D. V. O'Malley, M. V. Pathak, B. Prasad, and R. V. Rau.

MEDICINE AND THE LAW.

HARNETT *v.* BOND AND ADAM.

THERE has been furnished in these columns a very full account of this important case. It will be remembered that an original judgment awarded immense damages against Dr. C. H. Bond and Dr. G. H. Adam for the alleged wrongful detention of Mr. W. S. Harnett in a lunatic asylum. The trial lasted 16 days and we published a full summary of the evidence, speeches, and summing up in THE LANCET of March 8th, 1924. On appeal the judgment was set aside, and in THE LANCET of May 24th, 1924, will be found the considered judgments delivered in the case by Lords Justice Bankes, Warrington, and Scrutton. This week the House of Lords rejected the appeal of Mr. Harnett against the reversal by the Court of Appeal, while the importance of the case is recognised by the fact that the Lord Chancellor has stated that time would be taken to put their Lordships' reasons in writing.

THE LONDON SOCIETY OF APOTHECARIES RECOVER A PENALTY.

In the county court at Nuneaton the London Society of Apothecaries recently obtained judgment for £20 and costs against Mrs. Ashton, the Coton Drug Stores, Nuneaton. The defendant, having no qualification to act as an apothecary, had treated a child suffering from small-pox as if for a cold, with the result, it was alleged, that other persons had come in contact with the patient and had been infected. The sum of £20 thus recovered is the penalty prescribed by Section 20 of the Apothecaries Act of 1815, authority to sue for which is given by that Act to "The Master, Wardens and Society of the Art and Mystery of Apothecaries of the City of London." The penalty is not often sued for by the Society, presumably because practising as an apothecary without having the Society's certificate is an offence not easy to detect and prove without an elaborate system for that purpose. It will be observed that the proceedings in these cases are taken in a civil court and are not "prosecutions."

A notice of appeal has been entered.

ACTION ARISING OUT OF BARBER'S ITCH.

The probable origin of a case of tinea sycosis, or barber's itch, was recently the subject of conflicting medical evidence in the Court of Appeal. Barber's itch is a disease of the bearded parts of the face and neck, caused by *Trichophyton tonsurans* and marked by the formation of reddish concentric patches covered with dry fragile hairs and yellow scales or pustules. The appellant was a hairdresser, against whom judgment had been obtained in the Birkenhead county court for £19 15*s.*, the plaintiff's case being that he had been shaved on a certain Saturday in the appellant's shop, and on the next day had developed a rash which had been diagnosed later as "barber's itch." It was submitted on behalf of the barber that there was no evidence of negligence on his part, and none that the disease could not be contracted otherwise than by shaving; and that the evidence was consistent with the disease having been contracted elsewhere than in the barber's shop. The medical evidence called had ascribed the disease to the shaving, but medical evidence for the defence had contradicted this. Lord Justice Bankes, in giving judgment, said that there could be no question that if the plaintiff had become infected through being shaved it must be due to negligence on the defendant's part in not taking proper precautions. There was a conflict of evidence as to whether the disease contracted had in fact been barber's itch, but the county court judge was entitled to come to the conclusion at which he had arrived. There was evidence as to the defendant not being shaved daily, but going to the defendant's shop of a Saturday night, and evidence of the state of his skin on the evening in question. Upon such evidence it was open to the judge to find that the plaintiff had contracted barber's itch as claimed by him. The appeal was therefore dismissed.

THE CROWBOROUGH TRAGEDY.

The long trial of John Norman Thorne for the murder of Elsie Cameron at Crowborough on Dec. 5th, 1924, came to an end on Monday night last with the verdict of Guilty. The verdict was determined by the general circumstances of the case, but at one point the medico-legal evidence was of great significance, and not unanimous. Full consideration was given to detailed testimony in opposition to Sir Bernard Spilsbury's reasoned view, expressed for the Crown, that the bruises on the corpse were caused shortly before death and that there were no discoverable signs of hanging. The jury set aside the defence of an attempt at suicide by hanging. It is understood that an appeal is to be entered.

THE BATEMAN APPEAL.

As already explained in THE LANCET, it has been felt that material assistance ought to be offered to Dr. Bateman to meet the legal expenses of his recent successful appeal against conviction and to make good the deficiency in his professional income. Accordingly, the Bateman Fund has been opened and lists of contributions have appeared in recent issues. We have received additional contributions as follows:—

	£	s.	d.
Amount already received and acknowledged	353	14	6
Dr. Henry Russell Andrews	5	5	0
J. T. R.	5	5	0
Mr. Tyrrell Gray	5	0	0
Dr. A. Graham-Stewart	2	2	0
Dr. Joseph A. Arkwright	1	1	0
Dr. T. C. Blackwell	1	1	0
Dr. J. Newman Darling	1	1	0
Dr. J. C. Jefferson	1	1	0
Dr. W. Gifford Nash	1	1	0
Dr. Wilson Tyson	1	1	0
Dr. J. H. Stephen	1	0	0
Dr. Montegue Cutcliffe	0	10	6

Remittances should be forwarded to the Manager of THE LANCET, 423, Strand, W.C. 2, and made payable to the "Bateman Fund Account."

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED MARCH 7TH, 1925.

Notifications.—The following cases of infectious disease were notified during the week, namely:—Small-pox, 122; scarlet fever, 1606; diphtheria, 941; enteric fever, 41; pneumonia, 1441; puerperal fever, 39; cerebro-spinal fever, 6; acute poliomyelitis, 4; encephalitis lethargica, 61; continued fever, 1; dysentery, 8; ophthalmia neonatorum, 121. There were no cases of cholera, plague, or typhus fever notified during the week. The number of small-pox cases showed a decrease of 19 from the number for the preceding week. Thirty-one cases were notified from Derbyshire, 21 from Northumberland (Ashington, 13), 6 from Notts, and 45 from Yorks, North Riding (Middlesbrough C.B., 39).

Deaths.—In the aggregate of great towns, including London, there was 1 death from enteric fever, 111 from measles, 11 from scarlet fever, 108 from whooping-cough, 40 from diphtheria, and 361 from influenza, as compared with 346, 352, 354, and 291 in the four preceding weeks. In London itself the deaths from influenza numbered 59, from whooping-cough 30, and from diphtheria 16.

ROYAL COMMISSION ON NATIONAL HEALTH INSURANCE.—The twenty-first meeting of the Commission was held at the Home Office, Whitehall, on March 12th, Sir Andrew Duncan in the chair. The National Federation of Rural Approved Societies, represented by Mr. W. Wood and Mr. W. Hyde, gave evidence on the position and experience of rural societies under the insurance scheme. Evidence relating to a particular society, the Scottish Rural Workers' Society, was given by Mr. James Falconer and Mr. Wood. Thereafter Sir Norman Hill was examined on the working of the Seamen's National Insurance Society. The Commission announce that proof copies of the oral evidence and the relative statements submitted at the meeting of Feb. 26th are now on sale at H.M. Stationery Office.

Correspondence.

"Audi alteram partem."

THE BATEMAN FUND.

To the Editor of THE LANCET.

SIR,—In enclosing my contribution towards the Bateman Fund, I should like to say that I hope this appeal will meet with a very hearty response. If every member of the profession would send even a very small contribution, I do not doubt but that this would be of vast material help to Dr. Bateman—though nothing in the way of money can ever hope to recompense him for what he has had to go through. But it will show him that he has the help and the practical sympathy of his professional brethren—surely of some solace. I think the Proprietors of THE LANCET are to be highly congratulated on their generous contribution.

We are all a good deal at the mercy of patients, and even the most careful and conscientious medical man never knows the moment when he may be at the mercy of a jury utterly ignorant and incapable of judging a highly technical matter. It takes but little imagination to conjure up what Dr. Bateman has had to go through, and what the cost to him both in health and in practice must be.

I am, Sir, yours faithfully,

Margate, March 13th, 1925. A. GRAHAM-STEWART.

To the Editor of THE LANCET.

SIR,—I have great pleasure in forwarding you cheque as a small contribution to the Bateman Fund. I trust you will be able to raise a large sum for this very deserving object.

I am, Sir, yours faithfully,

Aberdeen, March 15th, 1925. JOHN H. STEPHEN.

HEALTH STATISTICS OF THE MERCANTILE MARINE.

To the Editor of THE LANCET.

SIR,—It is hoped that the timely leading article upon this subject which appeared in THE LANCET of March 14th will arouse the conscience of the Board of Trade as to its duty towards the men of this fine service.

In this connexion I would ask your permission to direct attention to one aspect of the health problem of the sailor which profoundly affects the general community. It is that of venereal diseases. The Merchant Shipping Act of 1916 provided that the expense of the treatment of the sick sailor should be borne by the owners of the vessel upon which he was employed; but it excluded from this benefit the seaman suffering from venereal disease and made no provision for him. While the Civil and the Service sections of the population have special V.D. schemes provided for them, the merchant seaman is practically neglected. From the nature of his occupation, the site of his labours, and the general conditions under which he exists, very special measures are required for dealing with him when he is suffering from venereal disease. At the present time there exists a large floating population of venereally infected mariners; these are sowing, and others are reaping, syphilis and gonorrhœa in every port in the world. I have the highest admiration for the merchant seaman, and I can claim an intimate knowledge of his life, his health, and his temptations owing to the fact of having at one time served as an ordinary seaman on ocean-going "tramps." It is a calling which is heavily infected with venereal disease—and indeed it is little wonder. The drink-shops and the harlots of "sailor-town" are always upon the look-out for the seaman with wages to spend. His arduous and cheerless life at sea, with its perils and its separation from home-life, make him, when

ashore, very susceptible to influences which part him from his money, and too frequently fasten upon him syphilis or gonorrhœa.

A few years ago Prof. E. W. Hope, M.O.H. for the City and Port of Liverpool, showed that 37 per cent. of the total patients attending the V.D. centre at Liverpool Royal Infirmary were seafarers, and that 15 per cent. of those were of foreign nationality. One would appeal for more adequate measures for dealing with these men. It is by no means sufficient to provide a treatment centre remote from the docks and expect to attract the men to it on week-days. There should be a treatment centre actually at the docks, and exclusively for the use of sailors. This should be open every night and all day on Sunday. At this place prophylactic treatment would be available. When a ship arrives in dock, a notice should be posted in the forecastle giving information as to the position of the treatment centre and the facilities it affords. From the nature of the calling of these men, the matter is really an international one and might well receive the attention of the League of Nations or the International League of Red Cross Societies. Only thus will the seaman be able to secure some approximation to continuity of treatment.

From an international public health point of view a V.D. examination of men joining a ship is of high importance. At these treatment centres this might be done, and inquiries made as to recent exposure to infection. If there had been such exposure, prophylaxis would be administered and a certificate to that effect would be attached to the man's papers. This would be destroyed at the end of the syphilis incubation period. If the man denied exposure, and in consequence did not receive preventive treatment and subsequently developed venereal disease, he would then be liable to stoppage of pay during his illness.—I am, Sir, yours faithfully,

Manchester, March 16th, 1925. E. T. BURKE.

OCULAR COMPLICATIONS IN GENERAL ANÆSTHESIA.

To the Editor of THE LANCET.

SIR,—In an article in the *British Journal of Anæsthesia* for October, 1923, entitled The Value of the Reflex Basis in the Interpretation of Phenomena during General Anæsthesia, I pointed out that inflammation of the conjunctiva could occur, apart from the introduction of anæsthetic liquid into the eye. The essential point referred to is, that mere exposure to air of such a delicate membrane as the conjunctiva is sufficient to produce inflammation if the protective mechanism—the blinking reflex—is removed. This reflex normally occurs two to three times per minute and prevents desiccation and deposition of minute particles by constant swilling with lacrymal secretion. If the administration of a general anæsthetic be prolonged, and the corneal reflex and lacrymal secretion abolished, the eyelids under these circumstances remain partially open, and the protective reflex being abolished, redness and inflammation of the conjunctiva may supervene. Elderly patients are especially prone to exhibit widely open eyes during general anæsthesia owing to the loss of tone of the orbicularis palpebrarum muscle, but any prolonged deep anæsthesia, especially if associated with shock, is apt to be associated with widely open lids, thus favouring the production of the condition. A series of observations were made in the case of a hospital resident whose anæsthetic cases showed an excessive proportion of inflamed eyes. No anæsthetic was allowed to get near the eyes, he was not allowed to take an eye reflex, the face pads were frequently changed, and yet at the end of the operation the conjunctiva was dry and showed vivid red injection. The complication may be avoided by frequent approximation of the lids and by rolling the upper lid over the globe of the eye from time to time so as to distribute the residual secretion, or failing this by putting a little warm saline into the eye. If this be done the conjunctiva will be perfectly pale at the end of the operation. Another cause of inflamed eyes which is not generally recognised is the presence of vomit, with dissolved anæsthetic, on the patient's pillow and this may get into the patient's eye. Immediate cleansing with warm saline will correct any ill effect.

An analogous condition used to be seen in the operation for removal of the Gasserian ganglion. If the ganglion were completely removed destructive changes were prone to supervene owing to the interruption of the reflex arc and elimination of the blinking reflex. It was usual to wash out the eye with antiseptic lotion and stitch the lids together to lessen the risk. I am, Sir, yours faithfully,

Manchester, March 14th, 1925. S. R. WILSON.

POST-PARTUM AVULSION OF THE UTERUS.

To the Editor of THE LANCET.

SIR,—My friend, Dr. Miles Phillips, has done well in calling attention to Mr. Hopkins Walters's case of avulsion of the uterus, and I have done ill in overlooking it in my article on Rupture and Avulsion of the Uterus at the Time of Labour: Cases which Recovered without Operation. In the general index of the Obstetrical Transactions it is indexed under "avulsion" and "uterus," but not under "rupture." I ought, therefore, to have found it, and I regret very much that I did not refer to Mr. Walters's very valuable paper.

I am, Sir, yours faithfully,

March 14th, 1925. HERBERT R. SPENCER.

THE ACIDIC VALUE OF THE URINE IN SKIN AND OTHER MANIFESTATIONS.

To the Editor of THE LANCET.

SIR,—Owing to absence abroad I was unable previously to reply to Dr. Whitfield's letter in your issue of Feb. 28th. From it I conclude either that he did not read my views set forth in your previous issue, or that he has failed entirely to grasp the essential points in my argument. His opening remarks: "If . . . . the urine is sometimes hypoacid, and there is no evidence of acidosis in the blood, I do not see why one should be tempted to try alkalies" shows this clearly. For the essence of my view concerning the ætiology of the seborrhœic state is that in it there is an accumulation of acids (*not* uric acid), which, owing to an insufficient supply of alkaline bases, are with difficulty, or only partially got rid of by the kidneys, but are vicariously excreted via the skin and mucous membranes. The urine, as a matter of fact, *is* usually hyperacid to litmus in seborrhœic persons, but it may occasionally be hypoacid; when, however, in the latter case alkalies are administered it becomes for a while progressively more acid, presumably owing to the fact that, with the increased quantity of alkaline bases available, the retained acids are at once turned out by the kidney. Dr. Doble and I are not alone in our observations on this point; it is an established fact, and I cannot suggest any other explanation than the one I have offered. Dr. Whitfield then says: "It would be interesting to know what controls he has carried out on apparently normal people." I definitely stated in my previous letter that I have used myself and others, with no trace of seborrhœa, as controls.

With regard to his remark on acne, I have always insisted that the primary seborrhœic state, and the secondary infections to which it predisposes, must be differentiated, and in my letter I said: "When once an infection with micro-organisms has become established, the factors of sensitisation and specific lowered resistance to definite strains of bacteria come into play, and the administration of alkalies alone is not sufficient to cure." (This sentence was unfortunately included in the paragraph on cheiropompholyx, to which it did not belong.) In chronic acne, seborrhœic

dermatitis and sycosis, for example, it is necessary not only to treat the underlying seborrhœic state, but also to employ measures—local and otherwise—to overcome secondary microbial infection.

But the whole object of my investigations has been to define and seek the explanation of the primary seborrhœic state, on which these secondary manifestations depend, and so to prevent relapse when the latter are cured. Dr. Whitfield concludes his letter by asking, "Are we then to accept a theory based on results which we cannot corroborate, and to continue a form of treatment which in our hands and the hands of others has proved futile?" The matter cannot be dismissed in this supercilious fashion. There is but little theory in my views, and there will be still less when my chemical co-workers have determined the actual nature of the acids concerned; this should not be very difficult now that the acidity of the saliva has been demonstrated. Dr. Whitfield must remember that the observations of Dr. Doble and myself are based on the examination of a very large number of patients and urines, that we have both used numerous controls, and that our statements are clinical and biochemical facts.

Dr. Doble's observation on the recrudescence of the skin condition, when too much alkali is given, I believe, only refers to cases of true seborrhœic eczema—i.e., where the inflammatory lesions are not due primarily to microbic infection. In these cases I can understand that both an excess of alkali or of acid would aggravate the eczema, but I have never observed a similar phenomenon in the commoner seborrhœic manifestations, although one should always bear in mind the possible dangers of inducing alkalosis by excessive dosage.

With regard to Dr. Agnes Savill's letter, she, like Dr. Whitfield, exaggerates the mere administration of alkali at the expense of my real conception of the seborrhœic state. If she will read again my remarks on the *ætiology* of the seborrhœic state, she will understand why the case she quotes recovered, for she ordered precisely the diet I recommend (with which I have cured many mild seborrhœics, without giving alkali or other treatment), and corrected the constipation that is so important a factor. I am doubtful whether the parathyroid and the acne vaccine played any part in the happy result obtained. One does not desire to condemn one's patients to an unnatural intake of alkali, which is purely a temporary measure, but to check their seborrhœic tendency by teaching them those rules of dietary and personal hygiene, the neglect of which has produced their disorders. Her question as to the acidity of saliva I cannot answer, but she must remember that slight degrees of the seborrhœic state are so common in the unnatural conditions under which we live, that the absolutely normal adult is relatively a *rara avis*. I do not know whether the saliva is acid in true gout, which has nothing to do with the seborrhœic state, although the two may be associated.

In conclusion, may I briefly refer to three recent cases:—

(1) A medical man, with acne and intense seborrhœa, was given a powder composed of 18 parts basic phosphates and 82 parts of bicarbonates. He reported that his early morning urine was "like hydrochloric acid" and that it required ten teaspoonfuls of the above powder per diem to make the morning urine alkaline.

(2) A lady consulted me for seborrhœa of the scalp and face, and acne of the back. She complained that the sweat of her axillæ (which was sharply acid to litmus), and "the acid skin" of her back rotted her clothing. The saliva was strongly acid. She was unwilling to employ any local treatment during her stay in London, and was merely given alkali, a laxative, and a diet sheet. She returned in three weeks delighted, because, after taking the alkali for one week, her underclothing was no longer spoilt. The saliva was much less acid. What other possible explanation can there be in this case except an abnormal acid excretion via the sweat glands and skin?

(3) Dr. Ryle has kindly supplied me with notes on the following case. Miss R., aged 33. For years troubled with "seborrhœic eczema." Since October has had a dry mouth and throat, small ulcers on the tongue, a metallic taste in her mouth, and has noted that *the gold arch of her denture has changed in colour, becoming redder than before.* Poor complexion, rough, greasy skin, intense seborrhœa capitis, patches of seborrhœic dermatitis on trunk and limbs. Saliva definitely acid to litmus. Urine very acid, equals 44 per cent. decinormal NaOH (phenolphthalein).

I am, Sir, yours faithfully,
H. W. BARBER.

Devonshire-place, W., March 9th, 1925.

THE PHYSIOLOGICAL ACTION OF MYDRIATIC ALKALOIDS.

To the Editor of THE LANCET.

SIR,—Years ago an article appeared in an English or American journal dealing with the chemical constitution and the physiological action of mydriatic alkaloids with, I think, special reference to atropine and the pharmacology of different samples. Being much interested at present in the last-named subject I am anxious to trace this article. You, Sir, have been kind enough to search your indices, but without success. I shall be very much obliged if any of your readers can help me to find it.

I am, Sir, yours faithfully,
ERNEST THOMSON, M.D.

33, Snowdon-place, Stirling, March 9th, 1925.

TWINS IN HEALTH AND DISEASE.

To the Editor of THE LANCET.

SIR,—Many readers of Prof. G. R. Murray's fascinating address upon this subject in THE LANCET of March 14th will doubtless recall examples from their experience to illustrate features of similarity often displayed by uniovular twins from the physical and the mental side. It is not particularly easy to advance examples of athletic equality—Prof. Murray gives as a solitary instance the Allen brothers in lawn tennis—for which reason I may be permitted to draw attention to the case of the twin brothers N. G. and C. M. Chavasse. Their athletic equality was really remarkable. They were sprinters of outstanding ability, and in 1907 they both represented Oxford against Cambridge in the hundred yards and quarter-mile races. I was assured by one of the brothers that they were quite undecided, in that season at any rate, that any difference existed between them and they had resolved to fight it out at Queen's Club. N. G. was successful in the shorter race, and by a happy chance victory went to C. M. in the quarter-mile. He won from his brother by a small margin, and I shall never forget the pretty spectacle of the twins racing each other round the last bend far ahead of their Light Blue rivals.

One recalls with reverence that N. G., who subsequently became a member of our profession, gave his life for his country in circumstances of such heroism that he was posthumously awarded a bar to the Victoria Cross which, together with the Military Cross, he had already gained and also the special Gold Medal of the British Medical Association. The military achievements of C. M., as a Chaplain to the Forces, supplied further evidence of similarity in another respect.—I am, Sir, yours faithfully,

Brook-street, W., March 14th. ADOLPHE ABRAHAMS.

HEXYL RESORCINOL.

To the Editor of THE LANCET.

SIR,—In view of the recent publicity given to the new synthetic compound hexyl resorcinol, we think it advisable to point out that this preparation is the subject of British patent applications by a foreign firm, and for this reason we have not manufactured it to meet the demands for supplies we have received from members of the medical profession.

We are, Sir, yours faithfully,
BURROUGHS WELLCOME & Co.

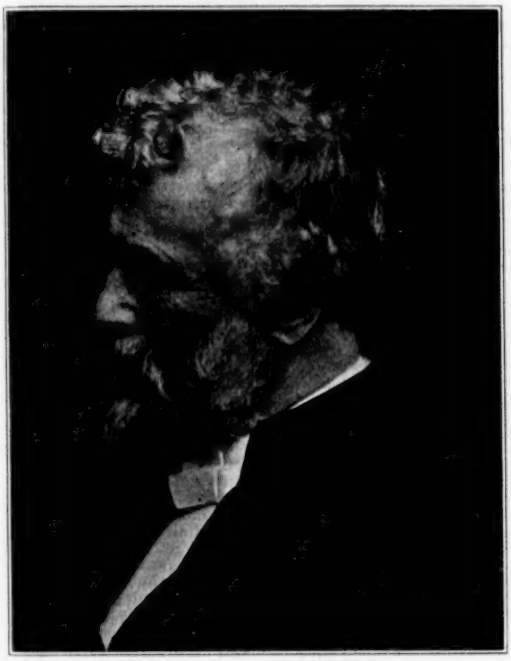
Snow Hill Buildings, London, E.C.,
March 13th, 1925.

Obituary.

JOHN CLELAND, M.D. EDIN., D.SC. Q.U.I., LL.D. ST. AND., GLASG., AND EDIN., F.R.S.,

EMERITUS PROFESSOR OF ANATOMY, UNIVERSITY OF GLASGOW.

BY the death of Prof. John Cleland, which took place at Chatham, where he was living in retirement, there has been removed from our midst a most prominent figure, a great teacher and worker in the field of science, and a philosopher. He will be deeply mourned by many generations of students, for few could resist the charm of his outstanding personality



JOHN CLELAND, M.D. EDIN.

and his great earnestness. Cleland was born in Perth in June, 1835; his life has therefore extended for practically 90 years, a long period when his great mental activity is taken into account. He was educated in the High School of Edinburgh and passed through his medical course in Edinburgh University, thereafter he studied for a year in Paris, returning to Edinburgh to graduate. His name was placed on the Medical Register in 1858. In Edinburgh he joined the staff of the University in the department of anatomy under the late Prof. Goodsir, whose original work greatly inspired the young demonstrator and whose memory he cherished throughout his life. A few years later he migrated to Glasgow, where he became senior demonstrator under the late Dr. Allen Thomson, at that time professor of anatomy in the University. In 1863 Cleland was transferred to the Chair of Anatomy in the then Queen's College, Galway, where he laboured incessantly for 14 years. His work must have been tremendous, for it embraced both anatomy and physiology and the surgical care of a large hospital. In addition he undertook the work, or a large part of it, of editing the seventh edition of "Quain's Anatomy," being one of three conjoined in the task, the others being William Sharpey and Allen Thomson. He also wrote a text-book of physiology, long a supreme favourite with students all over the country, and he carried out a large number of researches, the results of which are published in numerous papers.

Cleland returned to Glasgow in 1877 as successor to Allen Thomson in the Regius Chair of Anatomy, in which he continued his active labours until his resignation in 1909, a period of 32 years. Of his life in Glasgow it is first to be said that he was loved and admired by his students. Physically he was a commanding personality, standing over 6 feet high and broad in proportion, and with a head so large and balanced with the rest as to give to the whole figure a striking appearance of nobility. He was intensely quick and sensitive, but so gentle and sweet in his demeanour that ofttimes a chastisement, called for and begun, ended in pardon and perhaps a blessing. He was a great and clear-thinking teacher. But perhaps the greatest service which he rendered to his students was the example of courage which he constantly set them in maintaining and defending his opinions on matters falling within his own sphere of work, against opposition, however fashionable its origin might be. His devotion and sacrifice to his mother, who for many years and until an extreme old age remained as head of his house, a great dame in Glasgow society, and for whose sake he postponed marriage until 1888, two or three years after her death, were the subject of admiration by all.

In the fields of biological science Cleland was a great worker and thinker. He was an ardent evolutionist, greatly admiring the work of Darwin but perhaps with a leaning ot the theories of Lamarck. He has put forward his views in a series of papers entitled "Evolution, Expression, and Sensation," published together in one volume in 1881, and in 1887 in a volume of poetry entitled "Scala Naturæ and Other Poems" dealt with the same or similar topics. The philosophy of Darwin, eagerly assimilated by most of the scientific world, led many of Darwin's supporters into militant courses and not infrequently into materialistic conceptions, the latter more particularly in Germany. Cleland maintained a spiritual conception of life and nature, and for long was almost the only voice raised in this country against the irreligious tendencies of the age. But in the many controversies which ensued he fearlessly and brilliantly held his own. The whirligig of the times is bringing with it the justification of the courage of the great Glasgow philosopher and the proofs of the wisdom of his views. When Cleland passed into retirement his health was broken by many years of strenuous labour, and for 16 years he occupied practically a bed of sickness.

He is survived by a son, who during these final years, long drawn out, was his constant companion.

THE LATE DR. C. B. KER.

Dr. Alexander Joe writes as follows: "My colleagues and I at Colinton have read with great pleasure the obituary notice in THE LANCET with the appreciation by Dr. Andrew Balfour, who has told what manner of man our chief was when he knew him first 25 years ago. I think that, knowing Claude B. Ker after that lapse of time, there's not a man amongst us who would have expressed himself differently if he had been the possessor of Dr. Balfour's able pen. It is hard for us to realise that we shall see our beloved chief no more. His spirit so permeates the hospital that it seems as if he were away simply on one of his infrequent absences, and any minute we might expect to hear his well-known footfall along the covered corridors. Everyone has felt his loss as of a dear relative, for it is no exaggeration to say that he was loved and looked up to by everyone in the hospital. To those who have lived with him and worked with him the blow is a bitter one, and it is only now that we are beginning to realise how much of our work was of the nature of a personal service to our chief. He gave us a brilliant lead in both the amount and quality of our work, dealt with

us gently in the rough places, and was full of consideration for others, even in the most harassing circumstances. Old residents will remember him particularly at supper-time, when he would come in at the end of the day and talk about anything under the sun, take us into his confidence about men, matters, and books, and all the time reveal the sunny places in his extraordinarily well-stored mind. It is on occasions like these that we miss him most, and realise that his loss as a friend and as a guide to the manly exercise of our talents has made a gap that will never rightly be filled."

Medical News.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At an ordinary meeting of the Council of the College on March 12th Sir John Bland-Sutton, President, in the chair, Mr. Arthur Percy Dodds-Parker, surgeon to Radcliffe Infirmary, Oxford, was admitted a member of the Court of Examiners.—The honorary gold medal of the College was presented to Mr. Richard Higgins Burne, together with a document declaratory of its award to him for his valuable services to the College as curator of the physiological department of the museum and his important contributions to biological science.—The John Hunter medal in bronze, together with the triennial prize for 1922–24, was presented to Mr. Wilfrid Edward Le Gros Clark for his researches in anatomy.—Mr. James Sherren was re-elected a representative of the College on the Senate of the University of London, and Dr. W. S. A. Griffith was re-elected a representative of the College on the Central Midwives Board.—The thanks of the Council were given to Mr. G. Buckston Browne, M.R.C.S., for presenting to the College an oil painting described as a portrait of John Hunter by Gainsborough, and to the Wellcome Historical Medical Museum for the presentation of some photographic reproductions of illustrations from the Life of John Hunter by Jesse Foote, surgeon, London, 1794.—A vote of condolence on the death of Dr. J. A. Ormerod was unanimously passed.

KING EDWARD'S HOSPITAL FUND FOR LONDON.—The annual meeting of the President and Council was held on March 17th, the Prince of Wales presiding. The accounts and report for the year 1924 were received and the annual report adopted.

NAVAL MEDICAL COMPASSIONATE FUND.—A meeting of the subscribers of this fund will be held at 11.30 A.M. on April 17th at the Medical Department of the Navy, 68, Victoria-street, S.W. 1, to elect six directors of the fund.

ROYAL UNITED SERVICE INSTITUTION.—A lecture entitled a New Principle in Health and Education will be delivered by Mr. Arthur Lovell on March 26th at 5.30 P.M., when Dr. Jane Hawthorne will also read a paper on the Results of Experiments with the New Principle at an Infant Welfare Centre in London. Lieut.-General Sir Aylmer Haldane will preside.

BRITISH MEDICAL ASSOCIATION: *Scholarships and Grants in Aid of Scientific Research.*—The Council of the British Medical Association is prepared to receive applications for research scholarships as follows: An Ernest Hart Memorial Scholarship, of the value of £200 per annum, for the study of some subject in the department of State medicine. Three Research Scholarships, each of the value of £150 per annum, for research into some subject relating to the causation, prevention, or treatment of disease. Each scholarship is tenable for one year, commencing on Oct. 1st, 1925. A scholar may be reappointed for not more than two additional terms. A scholar may hold a junior appointment at a university, medical school, or hospital provided the duties of such appointment do not interfere with his work as a scholar.

The Council is also prepared to receive applications for grants for the assistance of research into the causation, treatment, or prevention of disease. Preference will be given, other things being equal, to members of the medical profession and to applicants who propose as subjects of investigation problems directly related to practical medicine.

The conditions of the award of scholarships and grants are stated in the regulations, a copy of which, with the prescribed form, will be supplied on application to the Medical Secretary of the Association, 429, Strand, London, W.C. 2. Applications for the year 1925–26 must be made not later than Saturday, June 6th, 1925. Applicants for research grants must furnish the names of three referees who are competent to speak as to their capacity.

THE North-Western Tuberculosis Society will hold a meeting at the Skin Hospital, Quay-street, Manchester, on Thursday, March 26th, at 3.30 P.M., when a demonstration, arranged by Dr. G. H. Lancashire, of tuberculous skin cases and methods of treatment, including light treatment, will be given.

HUNTERIAN SOCIETY.—The third dinner meeting of the Hunterian Society will be held at Simpson's Restaurant, 2 and 3, Bird-in-Hand Court, 77, Poultry, Cheapside, on Monday, March 30th, at 7.30 P.M. Price of dinner, 3*s.* 6*d.* (excluding wines). Intention to be present, with or without guests, should be signified to Mr. A. E. Mortimer Woolf or Mr. A. Westerman. After dinner there will be a discussion on the Use and Abuse of Drugs, opened by Prof. W. E. Dixon and Dr. H. H. Dale.

ROYAL MICROSCOPICAL SOCIETY.—A meeting of the section of this society which has been formed to deal with the industrial applications of the microscope will be held at 20, Hanover-square, London, W., on March 25th at 7.30 P.M. Sir David Prain, F.R.S., will preside. Dr. James A. Murray, F.R.S., will give the second of a series of three lecture demonstrations on the Making of Microscopical Preparations. Prof. Percy Groom, F.R.S., will read a communication on the Microscopical Investigation of Fungal Attacks on Wood, and Mr. A. P. H. Trevelli and Mr. R. P. Loveland will speak on the Application of Microscopy to the Photographic Industry.

MAUDSLEY HOSPITAL.—The second part of the eighth course of lectures and practical instruction, instituted by the London County Council for a diploma of Psychological Medicine, will begin on April 1st. The course consists of series of lectures and clinical demonstrations on various aspects of mental diseases, as follows: Eight lectures on the Psychoneuroses, by Dr. Bernard Hart; eight lectures on Morbid Psychology and six demonstrations in Clinical Psychiatry, by Dr. Edward Mapother; six lectures on the Pathology of Mental Diseases, including Brain Syphilis, its Symptomatology and Treatment, by Sir Frederick Mott; eight lectures on the Practical Aspect of Mental Deficiency, by Dr. F. C. Shrubsall; 12 clinical demonstrations in Neurology, by Sir Frederick Mott and Dr. F. L. Golla; six lectures on Crime and Insanity, by Dr. W. C. Sullivan; and lectures on the Legal Relationships of Insanity and Treatment, by Dr. C. Hubert Bond. The fees for the whole course are ten guineas, and for one single series of lectures two guineas. Further particulars as to the lectures may be obtained from the Director of the Pathological Laboratory, Maudsley Hospital, Denmark Hill, London, S.E. 5. In addition to the special lectures and demonstrations of the above course, there is opportunity for clinical experience and instruction available at the hospital. In particular there are a limited number of appointments available as clinical assistants; service in this capacity (either whole time or part time) is recognised by the various examining bodies as constituting the clinical experience required by the regulations for the diploma.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.—A meeting was held at the Elizabeth Garrett Anderson Hospital on March 10th, Miss M. Chadburn in the chair, when Dr. Dorothy Hare read a paper on the Value of the Electrocardiograph to the Physician and Surgeon. She said that she proposed to discuss the general principles of the subject and not to describe the technical details of the apparatus. The one she worked at the Royal Free Hospital was similar to the original Waller instrument, invented in 1887, with the exception that the capillary electrometer was now replaced by the Einthoven string galvanometer. While no mechanical means of investigation should ever replace careful clinical examination, there did undoubtedly exist cases with few physical signs, in which the additional information supplied by the electrocardiograph was a weighty factor in the diagnosis. She spoke of the ease of obtaining a reading without discomfort to the patient, the equipment at the hospital making it possible to carry out the whole process with the patient in bed if necessary. She then showed a series of interesting diagrams and records of clinical cases, selected in the main to bring out the special points which this method of investigation will elucidate. Dr. Hare pointed out that the normal tracing was by no means simple, and that the limits of variability of the normal had not yet been fully established. Secondly, cases illustrative of the value of the tracing in the determination of the condition of the myocardium were described. It was here that the electrocardiologist could be of help to the surgeon and obstetrician, as a definite opinion as to the patient's fitness for operation could be given from a study of the muscle element in the curve. Thirdly, a series of cases showing lesions of the conducting mechanism were then described. A short discussion followed, in which Dr. Dalby, Dr. Dobbie, Miss Alice Bloomfield, Dr. Lepper, Mrs. Flemming, and Miss Chadburn took part.

UNIVERSITY OF LIVERPOOL.—The University Council have invited Dr. J. E. W. MacFall, lecturer in toxicology, to accept the Chair of Forensic Medicine and Toxicology.

ROYAL INSTITUTION.—On Tuesday next, March 24th, at 5.15 P.M., Prof. A. S. Eddington will begin a course of two lectures at the Royal Institution on the Internal Constitution of the Stars; on Thursday, March 26th, at the same hour, Mr. T. Thorne Baker will deliver the first of two lectures on the Chemical and Physical Effects of Light, (1) Reproduction of Light Images by Photography, (2) Transmission of Light Images by Electricity; and on Saturday, March 28th, at 3 P.M., Prof. J. H. Ashworth will commence a course of two lectures on the Nervous System and Some Reactions. The Friday evening discourse on March 27th will be delivered by Sir Ernest Rutherford on Studies of Atomic Nuclei, and on April 3rd by Sir Daniel Hall on the Productivity of English Land.

SOCIETY OF SUPERINTENDENTS OF TUBERCULOSIS INSTITUTIONS.—The next ordinary meeting of this Society will be held at 122, Harley-street, at 3 P.M., on Monday, March 23rd, when a paper will be given by Dr. R. E. Wodehouse, secretary of the National Tuberculosis Association of Canada, on tuberculosis work in Canada, and another by Dr. Noel D. Bardswell on the results of an experiment on settling tuberculous men on the land. A discussion will also take place, initiated by Dr. Andrew J. Shinnie (Westminster) and Dr. Esther Carling (Peppard), on the weak points in the present scheme of treating tuberculosis at the public expense. It is hoped that a general practitioner will express the point of view of those in general practice.

THE MEDICAL OFFICER TO THE NUNEATON RURAL DISTRICT.—At a meeting of Nuneaton Rural District Council on March 11th a communication was read from the Ministry of Health pointing out that the local practitioner, whom the District Council wished to appoint as medical officer, did not hold either of the qualifications prescribed by Article 5 of the Sanitary Officers Order, 1922, whereas two of the candidates were specially qualified according to that Order. In the Minister's opinion any disadvantage which might result from residence outside the council's district would be outweighed by the advantage of obtaining the services of an officer with special experience and qualification in public health. On the information at present before him the Minister had decided that he would not be justified in exercising the power of dispensation reserved to him by Article 21 of the Order in respect of the appointment.

ROYAL MEDICAL BENEVOLENT FUND.—The annual meeting of this Fund was held at the Rooms of the Medical Society of London on March 17th, under the chairmanship of the President, Sir Thomas Barlow, when the report and financial statement for the year 1924 were submitted and approved. The report recorded an increase of £1000 in new subscriptions, which was balanced, however, by a similar sum lost, principally through the death of subscribers. The grant income showed an increase of £30 only, and the total income an increase of £130. The Committee of Management point out that the applications for help became more numerous each year, while the increase in the cost of living makes it necessary to give larger grants than formerly, and add: "The amount of distress and starvation of which many of the older applicants complain is so distressing that if it could only be better known to the profession there would at once be a large wave of benevolence which would pour money into the funds of the society for relief." During the year 343 persons have been relieved by grants and 147 by annuities, while the demands on the Fund steadily increase year by year quite out of proportion to the income. The income derived from subscriptions and donations amounted to £4846, and from invested property to £4343. The total income available for distribution was £9573, a decrease of £354 on the preceding year. The amount expended in grants was £5001, and in annuities £3476, making a total distribution of £8468, or an increase of £780. It was announced that the War Emergency Fund, part of which has been used to educate the children of medical men who had suffered in their incomes owing to the war, would come to an end next year. A special tribute was paid to the Ladies' Guild for its invaluable help, and it was mentioned that the British Medical Association had collected subscriptions of over £1100, while the medical and lay press had helped the Fund considerably. The deaths of Sir Clifford Allbutt, Sir Anderson Critchett, Sir Frederick Needham, Dr. G. E. Haslip, and Mr. J. H. Morgan meant the loss of valuable supporters of the Fund, the two last named being members of the Committee of Management. Sir Thomas Barlow was re-elected as President, Sir Charters J. Symonds as hon. treasurer, and Dr. G. Newton Pitt as hon. secretary.

RACIAL RESEARCH IN SWEDEN.—A lecture with illustrations will be given, entitled "Races and Racial Research in Sweden," on Monday next, March 23rd, at 8.30 P.M., by Dr. W. Krauss, in the rooms of the Royal Anthropological Institute, 52, Upper Bedford-place, London, W.C. The chair will be taken by Dr. F. C. Shrubsall, and the lecture will be accompanied with numerous illustrations. Dr. Krauss is attached to the Swedish State Institute for Race Biology.

NEW SUSSEX HOSPITAL FOR WOMEN AND CHILDREN. On the occasion of the annual meeting of the governors of this institution at Brighton, a hospital entirely officered by women doctors, Dr. Mary Scharlieb, C.B.E., opened the new X ray department, which had been installed thanks to the generosity of Mr. C. H. Corbett and Mr. Herbert E. Corbett. The present premises in Windlesham-road were only opened in August, 1921, but already there is need for extension from 30 beds to 50, and a preliminary appeal is being issued for £20,000 to enable another wing to be built. The year's work at the institution marked a great increase in patients, particularly those in the out-patient department. The balance-sheet was in a satisfactory position.

PEOPLE'S LEAGUE OF HEALTH.—The last of a series of nine lectures on What We Should Eat and Why, which are being given under the auspices of the League, will be delivered by Prof. W. E. Dixon on Wednesday, March 25th, at 6 P.M., at 11, Chandos-street, Cavendish-square, London, W. 1. The subject of Prof. Dixon's lecture is Food Preservation and Adulteration.—The ninth lecture of the Sims Woodhead series of constructive educational health lectures will be delivered by Sir Frederick Mott on Brain and Nervous System, at 6 P.M., on Monday, March 23rd, at the headquarters of the National Union of Teachers, Hamilton House, Mabledon-place, W.C. 1. The tenth, and final, lecture will be given by Dr. Tredgold on Development and Function of Mind, on Monday, March 30th, at the same hour and place.

MEDICAL SOCIETY OF LONDON: ANNIVERSARY DINNER.—The 152nd anniversary dinner of this Society was held in the Grand Hotel on March 11th, the President, Dr. Eustace M. Callender, in the chair. The toast of "The Medical Society of London" was given by Sir StClair Thomson in a happy speech illuminated with many quotations from Shakespeare and from the writings of the founder of the Society—Lettsom. Referring to the President, he said that Dr. Callender was the first general practitioner to hold that office since Lettsom himself occupied the chair. Dr. Callender, in reply, referred to Lettsom's opinion that "nothing had contributed more to the advancement of science than 'literary' societies." He spoke of the danger of specialists interpreting signs and symptoms in terms of their own specialty, and, in illustration, related a joke which appeared in the French comic press about 1880, when under the influence of Koch attention was being directed less to the patient than to his disease, where two "specialists" were depicted assuring a widow that her husband had died cured. The toast of "The Forces" was given by Sir Humphry Rolleston, and was responded to by Surgeon Vice-Admiral Joseph Chambers, Director-General of the Navy. "The Visitors," coupled with the names of Lord Riddell and Mr. Basil Hall, were proposed in amusing vein by Dr. Herbert Spencer. Sir Charters Symonds gave "The President," and Dr. Callender, in the course of his reply, paid a tribute to the work of the two secretaries of the Society, Prof. F. Langmead and Dr. J. E. H. Roberts.

TUBERCULOSIS SOCIETY.—An ordinary meeting of this society will be held at 1, Upper Montague-street, Russell-square, to-day (Friday) at 8 P.M. Dr. W. H. Dickinson, tuberculosis officer, Newcastle-on-Tyne, will give a paper, illustrated by lantern slides, on the League of Nations Post-graduate Course for Tuberculosis Workers.—The provincial meeting of the society will be held in Cambridge on April 2nd, 3rd, and 4th, in the pathological lecture theatre of the University. The following papers will be read:—April 2nd: Prof. W. E. Dixon, Treatment of Disease with Heavy Metals and Bactericidal Agents; and Dr. J. E. A. Lynham, X Rays in the Diagnosis of Pulmonary Tuberculosis. April 3rd: Dr. R. C. Matson, National Tuberculosis Association (America), (1) End-results and Limitations of Artificial Pneumothorax, (2) the Rôle of Thoracoscopy, Thoracoplasty, and other Surgical Procedures; Mr. Henry Platt (Manchester), Forms of Arthritis simulating Tuberculosis; Sir Henry Gauvain, the Present Position of Light Treatment in Surgical Tuberculosis; Dr. Louis Cobbett, Racial Susceptibility and Resistance to Tuberculosis. On April 4th Dr. Cobbett and Dr. Stanley Griffith will give a demonstration of pathological specimens, and, by the invitation of Dr. Jane Walker, a visit to East Anglian sanatoria will be made. Information as to lodging accommodation and cheap railway fares may be obtained from F. J. C. Blackmore, hon. secretary, at 138, Herbert-road, Plumstead, London, S.E. 18.

Parliamentary Intelligence.

HOUSE OF COMMONS.

TUESDAY, MARCH 10TH.

Mental Hospitals.

Mr. TAYLOR moved "that in the opinion of this House a reform of the conditions existing in mental hospitals is of urgent importance." He said that there was no need to wait for the report of the Royal Commission before giving effect to the recommendations of the Departmental Committee which reported last July. When they considered the physical and mental strain under which the magnificent body of men and women who formed the staffs of mental hospitals did the dirty work of society, a work which would be repulsive were it not for their gift of human charity, kindness, and love, when they considered that these people might be subjected to physical violence and the indescribable filth among which they had to pass their daily lives, he thought they were entitled to expect from the rest of society better treatment than they were getting to-day. The average wage of a fully qualified and trained male nurse in charge of a ward was less than the minimum wage of a police probationer. He thought that a 48-hour week was the right thing for mental hospital staffs, but the Committee which examined this specific problem 12 months ago reported in favour of 56 hours, giving a day and a half compulsory holiday, and he suggested to the Government that the Board of Control could by judicious pressure bring up the worst asylums to the level at any rate of the recommendations of that Committee. A fortnight ago, he said, he went through an asylum and discovered about 30 boys and girls who ought not to have been there at all. According to the medical superintendent of that institution, they were capable of being trained and educated in some degree, and they ought to have had an entirely different environment. As a matter of fact these children were in the wards with adult patients, with idiots, and with lunatics of every degree of suffering. The medical superintendent was a most humane and efficient administrator, but the difficulty was that there was no alternative accommodation. He had made representations to the local authorities, but they were up against the necessity for embarking on large capital expenditure. He hoped the Government would see their way to assist local authorities in this matter, because even the 60 per cent. grant which under the Mental Deficiency Act they could make towards capital expenditure of this kind was not sufficient in view of the financial position of many of the local authorities.

Mr. R. RICHARDSON, in seconding the motion, advocated placing mental cases under the charge of the health committees of the local authorities. He also wished to call attention to the insufficiency of the medical staff. In one hospital he knew very well there were only four doctors to attend to 400 patients. If there was a larger medical staff he believed that instead of 19 or 20 per cent. of recoveries that could be easily increased to 40 or 50 per cent. in the near future. As regarded nurses nearly every hospital with which he was acquainted was under staffed.

Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) said the Royal Commission, which was now sitting, was empowered to examine many of the points raised by Mr. Richardson. He hoped, therefore, that the hon. Member would not think that he was wanting in sympathy when he said that it would be better to await the judgment of that Commission before indicating any views which he held on the matter. He anticipated that the report of the Commission would be forthcoming next year. As soon as it was received it would obtain the immediate attention of the Ministry of Health. With regard to the question of the conditions of mental hospital staffs, he agreed that the work of mental nurses did not receive the public commendation that it deserved. These people ought to command every sympathy from the House and from the local authorities. So far as the Ministry of Health was concerned, they desired in every possible way to see that they received every sympathy and carried out their duties under the most favourable conditions. The Board of Control was most anxious that, at any rate, many of the recommendations of the Committee which had been referred to should be adopted by the local authorities. The Board had done and would do all in their power to improve the conditions of people who had such difficult tasks to carry out in their everyday life. But the difficulty was that the Board had no powers to enforce on local authorities better terms and conditions with regard to mental nursing. They would, however, continue, so far as they could, to bring the Committee's recommendations to the notice of local authorities.

Replying to a question by Mr. TAYLOR, Sir KINGSLEY WOOD said he would consider whether he could confer with the local authorities in the worst areas with a view to finding some method of meeting the most pressing needs.

The motion was by leave withdrawn.

WEDNESDAY, MARCH 11TH.

Blind Persons in England and Wales.

Mr. GROVES asked the Minister of Health the number of persons affected by the application of the Blind Persons Act, 1920; the number at present employed in the various workshops; the average wages paid; and the number of blind persons in receipt of the old age pension.—Mr. NEVILLE CHAMBERLAIN replied: The total number of known blind persons in England and Wales on June 30th, 1923, was 36,518. The number employed specifically in workshops is approximately 2090. The average wage—that is, the wage earned at the trade-union or other standard piece-work rates, is approximately 20*s.* a week, but, in addition to the wage actually so earned, augmentation is in all cases paid to blind workers. The number of blind persons between 50 and 70 years of age who were in receipt of pensions under Section 1 of the Blind Persons Act, 1920, was 11,525 on Dec. 31st last.

Foot-and-Mouth Disease Research.

Mr. STEPHEN MITCHELL asked the Minister of Agriculture the expenditure in connexion with the Foot-and-Mouth Disease Scientific Committee since March of last year; and what the available funds for this purpose amounted to.—Mr. WOOD replied: A grant of £10,000 from the Development Fund was sanctioned by the Treasury for the work of the Foot-and-Mouth Disease Scientific Committee during the present financial year, and of this sum £5500 was expended up to Feb. 28th. A grant of £15,000 has been approved to meet the expenses of the Committee in the coming financial year; this is the sum estimated by the Committee to be required.

Danger of Patent Medicines.

Mr. GROVES asked the Minister of Health whether he had considered the conditions under which patent medicines were manufactured and sold in this country as compared with other countries; whether he was aware that ill-informed persons were attracted by advertisements and thereby avoided proper medical attention; and whether he would consider what steps he could take to ensure public health and safety in this respect.—Sir KINGSLEY WOOD replied: The question of some statutory regulation of the conditions in which patent medicines are advertised and sold is under consideration, but unless a substantial measure of agreement can be secured, my right hon. friend does not anticipate that it will be possible to introduce legislation during the present session.

Health of Unemployed Men.

Mr. GROVES asked the Minister of Health if he had any information in regard to the health of the unemployed men and women of the country who had been out of employment for two years and upwards; and whether, in view of the fact that such persons might be assumed to be quite outside the National Health Insurance benefits, he had considered the issue of instructions to the various boards of guardians to arrange special medical attention to persons so affected.—Sir KINGSLEY WOOD replied: I think the hon. Member has overlooked the effect of the Prolongation of Insurance Act, 1921, which is still in force. In view of this Act it has not been thought necessary to make any special inquiries as to the health of unemployed persons, and my right hon. friend is not aware that there is any need for the issue of such instructions as are suggested in the last part of the question.

Condemned Houses in Occupation.

Mr. HORE-BELISHA asked the Minister of Health whether, in view of the necessity of obtaining an accurate estimate of the number of houses required, he could see his way to obtain statistics of the number of condemned houses which were still inhabited and of the number of persons occupying these houses; including children, particularly, in view of the fact that without these statistics no accurate estimate of the housing shortage could be made.—Sir KINGSLEY WOOD replied: Information is already furnished to my right hon. friend in the annual reports of medical officers of health as to the number of houses found, after inspection, to be unfit for human habitation. According to the last reports the number of such houses reported during the year 1923 was 14,367. My right hon. friend does not consider that the value of the further information asked for in the hon. Member's question would be commensurate with the labour and cost involved in obtaining it.

Employment of Pensions Medical Officers.

Colonel Sir ARTHUR HOLBROOK asked the Minister of Pensions, with reference to his promise that medical officers discharged from the medical staff employed by the Ministry would be given sessional work on medical boards, whether

he would give definite instructions to heads of the various areas that this practice must be continued.—Viscount CURZON replied: My hon. and gallant friend's suggestion is in accordance with the existing practice of the Ministry and instructions are being issued accordingly.

THURSDAY, MARCH 12TH.

Closing of Convalescent Centres.

Colonel DAY asked the Minister of Pensions what convalescent treatment and training centres had been closed in the past 12 months and where situated; whether it was proposed to close the remaining treatment and training centres; and, if so, on what dates.—Viscount CURZON replied: The centres at Barry and Blackpool were closed during 1924. The centre at Epsom is being closed this month. The remaining centre at Birmingham is still required and no date can at present be assigned for its closing.

Neurasthenics at Saltash.

Colonel DAY asked the Minister of Pensions the total cost per head, including establishment, medical attendance, and food, of the patients in the institution for neurasthenics at Saltash, Cornwall; and whether, if the cost be higher than would be the case if the men were given 100 per cent. pensions, he would, seeing that most of the men had been under treatment and away from their homes the greater part of the time since their discharge, consider the desirability of awarding life pensions and permit the men to be restored to their families.—Viscount CURZON replied: The total cost of the treatment given in the institution referred to is 34*s.* a week per head, exclusive of the personal allowances payable to the men and their families. If such allowances are included in the cost, the amount would, on an average, be in excess, and necessarily so, of the average amount that would be drawn by a pensioner on a pension for total disablement. The patients in this institution are admitted for the purpose of undergoing a specific course of treatment, and it would, therefore, not be in the interests of many of the cases to adopt the course suggested by the hon. and gallant Member, even if it were otherwise practicable. It is not, however, the intention of the Ministry that cases should remain indefinitely or unnecessarily in this or any other institution, and where they can suitably be dealt with by discharge to their homes with an appropriate rate of pension, this course is adopted.

Bonus for Ex-Service Medical Officers.

Colonel Sir ARTHUR HOLBROOK asked the Minister of Pensions whether he would consider the grant of a bonus to ex-Service medical officers now in the employ of the Ministry and under notice of discharge in cases where these officers had five years' service or more under the Ministry, seeing that those fortunate enough to be retained were to receive a rise of pay of £50 per annum in lieu of a bonus based on the number of years served.—Viscount CURZON replied: It is not customary for temporary civil servants to be paid a bonus on discharge, and my right hon. friend would not feel justified in urging upon the Chancellor of the Exchequer that the temporary medical officers of the Ministry of Pensions should be specially privileged in this respect. The hon. and gallant Member is under a misapprehension in thinking that the increase referred to in the last part of his question is being granted in lieu of any such bonus. It has been decided upon as part of a general scheme for the future remuneration of the medical officers of the Ministry, which has been framed after consultation with their staff association.

Patients in Mental Hospitals.

Lieut.-Commander KENWORTHY asked the Minister of Health how many persons were at present confined in mental hospitals; and how many of these were maintained solely at the public expense.—Mr. NEVILLE CHAMBERLAIN replied: On Jan. 1st, 1925, there were 111,200 persons confined in institutions for the insane in England and Wales; 102,313 were maintained at the public expense, but in many of the rate-aided cases contributions are recovered from the relatives.

Hospital Contributions Held Up.

The Marquess of HARTINGTON asked the Home Secretary whether his attention had been called to the fact that the management of a company in the hands of the receiver was unable to hand over to a hospital money held by it as employees' contributions to a joint hospital fund, and that in some cases money deducted from wages for the purpose of payment to hospitals had been held up nearly two years; and whether, having regard to the fact that such money could not under any circumstances be regarded as part of the assets of a company, he could arrange for it to be paid over to hospitals without unnecessary delay.—Sir P. CUNLIFFE-LISTER (President of the Board of Trade) replied: If my noble friend will give me particulars of any specific case which he has in mind I will have it looked into.

Deaths from Influenza.

Sir ALFRED BUTT asked the Minister of Health the number of deaths caused by influenza or its complications in London during January and February, 1925; whether these deaths had any correlation with age, occupation, or locality; and whether, in view of a probable return of the epidemic and its crippling effect on industry, he would consider any amendment of the National Health Insurance Acts to encourage the withdrawal of early influenza cases from factories, workshops, and offices during the most infectious period.—Mr. NEVILLE CHAMBERLAIN replied: The total number of deaths in London during January and February, 1925, notified as due to influenza, was 480, which is equivalent to 649 per million of the population per annum. I am sending detailed figures to my hon. friend showing the number of deaths in each of the London and metropolitan boroughs, and also the number in age-groups. Information as to occupations could not be given without a re-examination of the entry relating to each individual death. As regards the last part of the question, I think that an amendment of the National Health Insurance Act on the lines suggested would not be practicable. The effect of the Act is already in the direction desired by the hon. Member, inasmuch as it encourages workers to seek prompt medical advice as soon as they begin to feel ill, and by providing cash payments during absence from work owing to illness it alleviates the financial loss through such absence.

Opium Exports from India.

Mr. SCURR asked the Under Secretary of State for India the amount and value of the opium exports of India for the last five years, and how these exports were distributed to various countries.—Earl WINTERTON replied: The following is a statement of the number of chests exported from India to various countries during the years 1919–23. Figures for 1924 are not at present available.

Destination.	1919.	1920.	1921.	1922.	1923.
Singapore ..	4155	3090	3010	1820	2100
Hong-Kong ..	1009	180	120	150	240
Colombo. ..	50	60	70	60	30
Batavia . ..	2000	2900	2300	1800	900
Sydney	1	—	—	—	—
London	1700	100	—	—	—
Kobe	1150	900	150	50	150
Bangkok ..	1700	1700	1700	1650	1600
Saigon	1920	950	1655	1700	2975
Mauritius ..	—	35	—	—	—
Macao	—	531	440	500	240
Yokohama ..	20	—	—	—	—
Sarawak	—	—	—	55	125
British North Borneo ..	226	176	240	60	84
Bushire	—	—	85	283	100
Total	13,931	10,622	9770	8128	8544

The total value of the opium exported from India during the above five years is as follows. Particulars of the value of the opium exported to each individual country are not available.

Year.	Total value (Rs.).	Year.	Total value (Rs.).
1919 ..	3,42,16,390	1922 ..	2,96,36,088
1920 ..	3,28,35,830	1923 ..	3,44,12,829
1921 ..	3,16,30,584		

Colonial Revenues from Opium.

Mr. CAMPBELL asked the Secretary of State for the Colonies what proportion in the total revenues, for the last year for which figures were available of the Straits Settlements, Federated Malay States, North Borneo, and Brunei respectively, was derived directly or indirectly from opium.—Mr. AMERY replied: For the year 1923, which is the latest year for which complete figures are available, the revenues derived from opium by the Governments of the Straits Settlements, the Federated Malay States, and Brunei formed 45·4 per cent., 16·9 per cent., and 18·24 per cent. respectively of the total revenues collected by these Governments; as regards North Borneo, the latest year for which I have information is 1921, when the proportion was 12·3 per cent.

Infantile Mortality at Market Drayton.

Sir CHARLES OMAN asked the Minister of Health whether he had received a report from the medical woman inspector as to the high rate of infantile mortality at Market Drayton; whether the report had been published; and what was the rate of infantile mortality in that union for 1924, as compared with that of the neighbouring unions of Wellington and Newport and with that of Shropshire as a whole.—Mr. NEVILLE CHAMBERLAIN replied: The answer to the first part of the question is in the affirmative, and to the second part in the negative. I have, however, communicated to the

county council certain suggestions arising out of the report and am now awaiting their reply. As regards the last part of the question, figures are not available for unions, but the following are the figures for 1924 for the urban districts mentioned in the question and the county as a whole:—

Urban district.	Births.	Deaths (under one year).	Infantile mortality (per 1000 births).
Market Drayton ..	77	7	91
Wellington . ..	135	4	30
Newport	48	2	42
County of Salop ..	2119	127	60

Asylums under Local Authorities.

Major GLYN asked the Minister of Health how many asylums for lunatics were under the administration of local authorities now and for the years 1900 and 1914; what was the total number of inmates now and for the same years; and what was the present-day cost of maintaining these institutions.—Mr. NEVILLE CHAMBERLAIN replied: The figures are as follows:—

Year (1st Jan.).	Number of inmates.	Number of institutions.
1900	74,004	79
1914	105,504	97
1925	105,399	97*

* This figure does not include Ewell Epileptic Colony—loaned to Ministry of Pensions; and Maudsley Hospital, which provided accommodation on Jan 1st, 1925, for 146 uncertified patients.

The cost of maintenance (excluding loan charges) during the year ending March 31st, 1924, was £6,242,284.

FRIDAY, MARCH 13TH.

Summer-Time Bill.

Lieut.-Colonel A. L. WARD moved the second reading of the Summer-Time Bill, a measure providing for the permanent adoption of summer-time to begin on the Sunday following the first Saturday in April and end on the Sunday following the first Saturday in October.

Mr. A. RAWSON seconded.

Sir H. HOPE moved the following amendment: "That this House, while approving the introduction of summer-time, declines to give a second reading to a Bill which, unless it is limited to the months of May, June, July, and August, must inflict grave injury to the industry of agriculture."

Replying to Mr. B. PETO, the Speaker said that the effect of the amendment would undoubtedly be to kill the Bill, and he imagined it was so intended.

Dr. LITTLE said that it was at the request of the medical members of his constituency (London University), and as a medical man himself and a hospital physician in London for 25 years, that he supported the fullest application of this Bill. The opposition to the Bill came largely from agriculturists, who were in the fortunate position of spending all their lives in the fresh air, and who hardly realised how very selfish their action was in preventing some little opportunity of the same kind to the classes who were not in such a position. He urged from the medical point of view that they were on the eve of great extensions of knowledge of the properties of sunlight. His branch of medicine had led to a special study of its effects, and anyone who visited the light department of any of the great London hospitals would see the transformation of human wrecks into reasonably healthy persons as the result of sitting for a half an hour three times a week in front of a feeble imitation of sunlight coming from a carbon arc lamp. The importance of sunlight and the importance of fresh air could not be over-estimated, and both would be immeasurably increased for large numbers of people by this Bill. The study of the pathological effects of fresh air and sunlight showed that they had an enormous influence on nutrition generally. He would like to see people wear less clothes in the sunlight, but as they could not go the whole extent, he hoped they would clothe themselves in such a way as to get as much benefit as possible from the sunlight and fresh air.

Sir W. JOYNSON-HICKS (Home Secretary) said that the Government proposed to leave the second reading of the Bill to a free vote of the House. If the second reading was carried and the measure passed through Standing Committee—where he hoped there would be no organised opposition—the Government would take it up and give the necessary facilities for its further passage. But on the report stage he would arrange for a free vote to be taken in the House as to the dates of the beginning and ending of the summer-time period.

After further debate the amendment was rejected by 289 votes to 63—majority against 226. The Bill was then read a second time.

MONDAY, MARCH 16TH.

Medical Referees and Hospital Cases.

Mr. BENJAMIN SMITH asked the Home Secretary whether a medical referee under the Workmen's Compensation Acts who was also on the staff of a voluntary hospital was not permitted to give a report on a case under his care at that hospital; and, if so, whether, seeing that this might involve injustice to the patient examined, as no other doctor could know as much of the case, he would consider the advisability of withdrawing the instruction or regulation.—Mr. LOCKER-LAMPSON (Under Secretary to the Home Office) replied: There is no specific Home Office instruction or regulation which prevents the doctor in such a case giving the workman or the employer a report on the condition of the workman, but if a referee is employed in any case by or on behalf of either party, he is precluded by the Statute from acting subsequently as referee in that case. It is also generally undesirable that referees should act for either party in compensation cases, especially cases which are the subject of dispute. My right hon. friend will, however, consider the matter further in the light of the hon. Member's representation, and if he has any particular cases in mind, the Home Secretary would be glad to be furnished with the details.

Mentally Defective Children in Scotland.

Mr. STEPHEN MITCHELL asked the Secretary for Scotland what arrangements existed for the education of slightly mentally defective children in the towns and also in the rural districts of Scotland.—Sir J. GILMOUR replied: The provision of schools and classes for mentally defective children in the towns and rural districts of Scotland as at July 31st, 1923, is stated in Table 4 of the latest "Return showing Grant-earning Day Schools and Institutions." Since the date of that return the number of schools and classes has been increased, but the final figures are not yet available.

Milk and Dairies Act, 1915.

Mr. BARNES asked the Minister of Health whether, in view of his decision to allow the Milk and Dairies Act, 1915, to become operative from Sept. 1st next, those provisions of the Act which would be administered by order of the Minister would all be enforced from that date; and, if so, whether he would publish drafts of the Orders at an early date and arrange for consultation with the interests concerned before submitting the draft Orders to Parliament.—Sir KINGSLEY WOOD replied: My right hon. friend is unable at present to say on what date the Orders to be made in pursuance of the Milk and Dairies Act, 1915, will come into operation, but, as the hon. Member is no doubt aware, until the new Orders are made the existing Orders will continue in force. It is certainly the intention of my right hon. friend to consult the interests concerned before any new Orders are laid before Parliament.

Elimination of Bovine Tuberculosis.

Mr. HURD asked the Minister of Agriculture whether, following upon the visit of his scientific advisers to North America, he proposed to adopt in this country such administrative measures for the elimination of bovine tuberculosis as had proved successful in the United States and Canada.—Captain HACKING (Vice-Chamberlain of the Household) replied: My right hon. friend has at present under consideration means for the elimination of bovine tuberculosis, and he is proposing to introduce shortly a measure on the lines of the Tuberculosis Order of 1914, which is a necessary first step in any procedure of the kind.

Hospitals for British Troops in India.

Sir PHILIP RICHARDSON asked the Under Secretary of State for India whether any report had been received from India as to giving effect to the recommendations of the British Station Hospital Committee of 1918; and when he expected to take action to improve the standard of comfort and accommodation in hospitals for British troops in India.—Earl WINTERTON replied: I am sending the hon. Member a detailed statement supplied by the Government of India. Progress is being made as fast as financial conditions permit.

TUESDAY, MARCH 17TH.

Sanatoria Accommodation in Glasgow.

Mr. COUPER asked the Secretary for Scotland whether any complaints had been received in regard to the sanatoria accommodation in Glasgow; how many persons were waiting for admission to sanatoria in Glasgow on March 7th; and what was the longest period any of these applicants had been waiting for admission.—Sir J. GILMOUR replied: The reply to the first part of the question is in the negative. On March 7th the number of cases of pulmonary tuberculosis awaiting admission to institutions was 71, of which 23 were cases recommended for sanatorium treatment. Normally the period of waiting for pulmonary cases recom-

mended for institutional treatment does not exceed from 10 to 14 days. During winter pressure a case may wait for as long as two months, but regard is had in every case to the patient's condition and in the event of urgency admission would be arranged without delay.

Medical Women and the Post Office.

Miss WILKINSON asked the Postmaster-General whether he was aware that the Post Office was the only Government department which paid its women doctors less than its men doctors for similar work; and whether, in view of the fact that the Post Office advertisements for posts at present vacant were being refused by the medical journals in consequence, he would bring his department into line with other departments in this matter.—Sir W. MITCHELL-THOMSON replied: The conditions under which women medical officers are employed in the Post Office are not analogous with those of other departments. The question of equal pay for men and women is one which affects the whole of the Civil Service, and I am not in a position to recommend an exception in respect of this particular class of civil servant.

Mental Deficiency Bill.

Sir LESLIE SCOTT introduced the Mental Deficiency (Amendment) Bill, a measure to amend Section 7 of the Mental Deficiency Act, 1913, for the purpose of enabling a defective to be removed from an institution for the purpose of being placed under guardianship.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Monday, March 23rd.

MEETING OF THE SOCIETY: at 5.30 P.M.
Special Discussion (continued from Feb. 16th) on Non-specific Disturbances of Health Due to Vitamin Deficiency.
Speakers:
Dr. William Hunter, Dr. Robert Hutchison, and others.

ODONTOLOGY: at 8 P.M.
Casual Communication:
Mr. G. J. Harborow: A Dental Cyst in Connexion with a Deciduous Tooth.
Paper:
Mr. A. Livingston: The Permeability of Enamel.

Tuesday, March 24th.

SURGERY, MEDICINE, PATHOLOGY } *Special Discussion:* at 8 P.M. The Treatment of Septicæmia.
Openers:
Sir Thomas Horder (Medicine), Mr. R. P. Rowlands (Surgery), and Dr. L. Colebrook (Pathology).

Wednesday, March 25th.

COMPARATIVE MEDICINE: at 5 P.M.
Paper:
Sir Stewart Stockman: A Review of Some Problems of Foot-and-Mouth Disease (with lantern demonstration).

Thursday, March 26th.

EPIDEMIOLOGY AND STATE MEDICINE: at 5.30 P.M.
Paper:
Dr. W. L. Burgess (M.O.H. Dundee): An Outbreak of Food Poisoning.

UROLOGY: at 8.30 P.M.
Clinical and Pathological Evening.
Members wishing to exhibit specimens are requested to notify the Hon. Secretary (Mr. Sydney G. MacDonald, 51, Queen Anne-street, W.) as soon as possible.

Friday, March 27th.

STUDY OF DISEASE IN CHILDREN.
Clinical Meeting at 4.30 P.M. at the National Hospital for the Paralysed and Epileptic, Queen-square, W.C.
Cases will be shown.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.
MONDAY, March 23rd.—8.30 P.M., Discussion on Oxaluria, to be introduced by Mr. L. Bathe Rawling, followed by Sir William Willcox and others.

ROYAL MICROSCOPICAL SOCIETY, 20, Hanover-square, W.
WEDNESDAY, March 25th.—7.30 P.M., Dr. J. A. Murray: Imbedding and Section-Cutting.

HARVEIAN SOCIETY OF LONDON, Town Hall, Paddington Green, W.
THURSDAY, March 26th.—8.30 P.M., Discussion on Obstruction of the Colon. To be opened by Sir Crisp English, followed by Mr. T. P. Legg, Dr. Arthur Hurst, Mr. Lockhart-Mummery, Mr. Gordon-Taylor, Dr. Montague Smith, and others.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos-street, Cavendish-square, W.
FRIDAY, March 27th.—8.30 P.M., Discussion on Gonococcal and Syphilitic Infections of the Eye. To be opened by Mr. Bishop Harman, followed by Mr. Cyril Hudson and Mr. T. H. Benians.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.
MONDAY, March 23rd, to SATURDAY, March 28th.—WEST LECTURE HALL, Royal Society of Medicine. Monday, March 30th, at 5.30 P.M., Mr. Ernest Clarke: Myopia—its Diagnosis and Treatment. Wednesday, April 1st, at 5.30 P.M., Dr. Robert Knox: Demonstration on X Rays in the Diagnosis of Lesions on the Right Upper Quadrant of the Abdomen.—BROMPTON HOSPITAL FOR DISEASES OF THE CHEST. Second week as per syllabus.—CENTRAL LONDON OPHTHALMIC HOSPITAL, Judd-street, W.C. Lecture-demonstrations in Diseases of the Eye. Daily from 1.30 P.M.—NORTH-EASTERN FEVER HOSPITAL, St. Ann's-road, Tottenham. Wednesday and Saturday, 11 A.M., Demonstrations and Treatment of the Acute Infectious Diseases, by Dr. Frederic Thomson.—ROYAL NORTHERN HOSPITAL, Holloway-road, N. Intensive Course (first week).—CHELSEA HOSPITAL FOR WOMEN. Special Course as per syllabus. Mostly afternoon work.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, March 23rd.—12 noon, Mr. Simmonds: Applied Anatomy. 2 P.M., Dr. Scott Pinchin: Medical Out-patients. 2 P.M., Mr. Addison: Surgical Wards.
TUESDAY.—11 A.M., Mr. Endean: Venereal Diseases. 12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Sinclair: Surgical Out-patients.
WEDNESDAY.—11 A.M., Medical Registrar: Medical Wards. 2 P.M., Dr. Burnford: Medical Wards. 2.30 P.M., Mr. Donald Armour: Surgical Wards.
THURSDAY.—11 A.M., Sir Henry Simson: Gynæcological Wards. 2 P.M., Mr. MacDonald: Genito-Urinary Dept. 2 P.M., Mr. Bishop Harman: Eye Dept.
FRIDAY.—11 A.M., Dr. McDougal: Electrical Dept. 10.30 A.M., Dr. Dowling: Skin Dept. 2 P.M., Mr. Vlasto: Throat, Nose, and Ear Dept.
SATURDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.
Daily, 10 A.M. to 6 P.M., Saturday, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
FRIDAY, March 27th.—4.30 P.M., Dr. W. Jenkins Oliver: Some Common Dermatoses of Children.
Daily, In-patient and Out-patient Cliniques, Operations, Cliniques in Special Departments, &c

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, Bloomsbury, W.C. 1.
POST-GRADUATE COURSE: FEB.–MARCH, 1925.
CLINICAL LECTURES AND DEMONSTRATIONS.
MONDAY, March 23rd.—2 P.M., Out-patient Clinic: Dr. Hinds Howell. 3.30 P.M., Syphilis of the Nervous System (3): Dr. Adie.
TUESDAY, March 24th.—2 P.M., Out-patient Clinic: Dr. Adie. 3.30 P.M., Disseminated Sclerosis: Dr. Birley.
THURSDAY, March 26th.—2 P.M., Out-patient Clinic: Dr. Kinnier Wilson. 3.30 P.M., Cerebellar Disease: Dr. Gordon Holmes.
FRIDAY, March 27th.—2 P.M., Out-patient Clinic: Dr. Gordon Holmes. 3.30 P.M., Demonstration of Physical Exercises in Exercise Room: Mr. Elmquist.
COURSE OF LECTURES AND DEMONSTRATIONS ON THE PATHOLOGY OF THE NERVOUS SYSTEM.
THURSDAY, March 26th.—12 noon, Inflammatory Reactions in the Central Nervous System: Dr. J. G. Greenfield.
COURSE OF LECTURES AND DEMONSTRATIONS ON THE ANATOMY AND PHYSIOLOGY OF THE NERVOUS SYSTEM.
MONDAY, March 23rd.—12 noon, Reflexes: Dr. Hinds Howell.
A COURSE OF CLINICAL DEMONSTRATIONS, chiefly on METHODS OF EXAMINATION OF THE NERVOUS SYSTEM, is held in the Wards at 10 A.M. on Tuesdays and Fridays by Dr. H. J. Macbride.
COURSE OF LECTURES AND DEMONSTRATIONS ON THE NEUROLOGY OF THE EYES.
WEDNESDAY, March 25th.—3.30 P.M., The Oculomotor Nerves.
WEDNESDAY, April 1st and 8th: The Trigeminal Nerve: Mr. Leslie Paton.
Mr. Armour and Mr. Sargent operate at the Hospital on Tuesday and Friday mornings at 9 A.M. or at such other times as may be announced. Full particulars on application to
J. G. GREENFIELD, Dean of Medical School.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, March 20th.—4 P.M., Mr. Nicol Rankin: Nasal Sinus Suppuration.

HOSPITAL FOR SICK CHILDREN, Gt. Ormond-st., W.C.
THURSDAY, March 26th.—4 P.M., Mr. Addison: Cleft Palate.

MANCHESTER ROYAL INFIRMARY.
TUESDAY, March 24th.—4.15 P.M., Dr. C. H. Melland: Drugs of Power.
FRIDAY.—4.15 P.M., Dr. J. C. Bramwell: Electrocardiographic Demonstration. Mr. P. R. Wrigley: Surgical Demonstration.

THE PEOPLE'S LEAGUE OF HEALTH.
Lectures on What We Should Eat and Why, at the Medical Society of London, 11, Chandos-street, W.
WEDNESDAY, March 25th.—6 P.M., Prof. W. E. Dixon: Food Preservation and Adulteration.

Appointments.

ELLIS, H., M.B., B.S. Lond., D.P.H., has been appointed Assistant Medical Officer of Health for Ealing.
RAE, HARRY J., M.B., Ch.B. Aberd., D.P.H., Chief Medical Officer of Health for Aberdeenshire.
TURNER, ADAM A., M.B., Ch.B. Aberd., D.P.H., Medical Officer of Health for Finchley.
Salford Royal Hospital: MCCREA, E. D'ARCY, M.B., B.Ch. Dub., Surgical Registrar; STOUT, A. J., M.B., Ch.B. Edin., House Surgeon; WARBURTON, EDWARD, M.R.C.S., L.R.C.P. Lond., Casualty House Surgeon.
Certifying Surgeons under the Factory and Workshop Acts: TIDCOMBE, F. S., M.R.C.S., L.R.C.P. Lond. (Bognor); BARNES, R. G., L.R.C.P. & S. Edin., L.R.F.P.S. Glasg. (Tenterden).

Vacancies.

For further information refer to the advertisement columns.

Belfast, Mater Infirmorum Hospital.—Hon. Asst. Gynæcologist.
Belgrave Hospital for Children, Clapham-road, S.W.—H.P., H.S., and Asst. H.P. at rate of £100.
Benenden, Kent, National Sanatorium.—Res. Asst. M.O. £300.
Board of Education.—M.O. £600.
Bristol University.—Lecturer in Physiology.
British Guiana.—Asst. M.O.H. £500.
British Hospital for Mental Disorders, 72, Camden-road, N.W.—Hon. P.
Bromley Borough.—M.O.H. £800.
Cardiff City.—Two Asst. M.O.'s. Each £600.
Evelina Hospital for Children, Southwark, S.E.—H.S. at rate of £120. Also Anæsthetist. 25 guineas.
Exeter, Royal Devon and Exeter Hospital.—Asst. H.S. at rate of £150.
Folkestone, Royal Victoria Hospital.—R.M.O. at rate of £150.
Glasgow, Consumption Sanatoria of Scotland, Bridge of Weir.—Res. M.O. £200–£250.
Hospital for Sick Children, Great Ormond-street, W.C.—H.S., H.P., and Asst. Cas. O. Each at rate of £50.
Hull Royal Infirmary.—Asst. H.S. £150.
Hull and Goole Port Sanitary Authority.—Asst. M.O.H. £750.
Leeds City.—Asst. M.O.H. for Maternity and Child Welfare. £600.
Leicester Royal Infirmary.—H.S. at rate of £125.
Liverpool County Borough, Local Education Authority.—Three Jun. Asst. School M.O.'s. £600.
Liverpool, Mill Road Infirmary.—Res. Asst. M.O. £200.
Liverpool Sanatorium, Delamere Forest, Frodsham.—Asst. M.O. £200.
London Homœopathic Hospital, Great Ormond-street, W.C.—Third Anæsthetist. £50.
London Lock Hospital, 91, Dean-street, W.—Surg. Reg. £100.
Maidstone, West Kent General Hospital.—H.S. at rate of £220.
Middlesex Hospital Medical School.—University Chair of Biochemistry. £800.
Ministry of Health, Whitehall, S.W.—M.O.'s. £800.
Newcastle-upon-Tyne, Royal Victoria Infirmary.—Res. Appts. Each at rate of £50.
Paddington Green Children's Hospital, W.—H.P. and H.S. Each at rate of £150.
Prince of Wales's General Hospital, Tottenham, N.—H.S., Spec. H.S., H.P. Each at rate of £150. Also Jun. H.S. and Jun. H.P. Each at £110.
Putney Hospital, Lower Common, Putney, S.W.—R.M.O. £150.
Queen Mary's Hospital for the East End, Stratford, E.—Hon. Asst. P.
Queen's Hospital for Children, Hackney-road, Bethnal Green, E.—R.M.O. £200. H.S. at rate of £100.
Redhill, Surrey, Royal Earlswood Institution.—Jun. Asst. M.O. at rate of £250.
Rochdale Infirmary and Dispensary.—Jun. H.S. £200.
Royal Chest Hospital, City-road, E.C.—Phys.
St. Pancras Dispensary, 39, Oakley-square, N.W.—Hon. Phys.
Shrewsbury, Royal Salop Infirmary.—H.S. £250. L.P. at rate of £160.
Suva, Fiji.—Port. M.O. and Bacteriologist, &c. £750.
Wallasey, Victoria Central Hospital.—Hon. Asst. Ophth. S.
West African Medical Staff.—Medical Officers.

Births, Marriages, and Deaths.

BIRTHS.

LEWIS.—On March 7th, to Dr. and Mrs. R. T. Lewis, 124, Fellows-road, Hampstead, N.W. 3—a daughter.
MACLAUGHLIN.—On March 13th, at Kensington Court, W., the wife of Colonel A. M. MacLaughlin, M.B., C.B.E., R.A.M.C., Res. Offs., of a daughter.
QUINTON.—On March 9th, at 99, Tollington Park, N. 4., the wife of Percival G. Quinton, M.D., of a daughter.
RICHARDSON.—On March 10th, at Leicester-road, Loughborough, the wife of C. G. Richardson, M.D., F.R.C.S., of a son.
RIDOUT.—On March 14th, at St. Elmo, Southsea, the wife of C. A. Scott Ridout, M.S., F.R.C.S., of a son.
SHELDON.—On March 12th, at Albert-road, Southport, the wife of Harold Sheldon, M.D., of a daughter.

MARRIAGES.

FAIRLEY—PLEWS.—On March 11th, at Christ Church, Burbage, Buxton, Keith Douglas Fairley, M.D., M.R.C.P., to Eileen, elder daughter of Mr. and Mrs. Leonard Plews, of Buxton.

DEATHS.

ALLWORTH.—On March 13th, at Parliament House, Peckham-road, Alfred Allworth, M.D., L.D.S., aged 87.
CASTLE.—On March 11th, Richard Field Castle, M.B., B.Ch. Camb., of Thornhill House, Darfield, Yorks, aged 64 years.
KIRBY.—On March 14th, at his residence, Kilden, Sutton Court-road, Chiswick, after a short illness, William Egmont Kirby, M.D.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

SUNDERLAND ROYAL INFIRMARY.—This hospital is so crowded, and so many patients are awaiting admission, that the first portion of large extensions is being put in hand. The new block now begun will provide 78 additional beds, which will increase the total number to 318. The Nurses' Pension Fund is in danger of exhaustion. The only remaining investment represents £1050, and the fund is overdrawn.

LEEDS WORKPEOPLE'S HOSPITAL FUND.—At the thirty-eighth annual meeting the Executive Committee of the Leeds Workpeople's Fund presented a record report; the striking feature being that the workshop collections amounted to over £30,000 out of a total income of £40,086—the largest amount ever collected in one year and exceeding by over £3000 the amount collected last year. From the total amount, £20,000 was allocated to the Leeds General Infirmary, £3000 to the Leeds Public Dispensary, £2500 to the Hospital for Women and Children, £1000 to the Maternity Hospital, and to other and smaller hospitals grants in proportion were made. In 1916 the amount granted to the Leeds Infirmary was £5000 and the total grants were £7775.

BRIGHTON AND HOVE PROVIDENT DENTAL HOSPITAL.—The growing recognition by the public of the need for proper dental care was marked by the enormous increase in the number of attendances at this institution during 1924, the report submitted at the annual meeting on March 5th showing an increase of nearly 2000—4802, as against 2807 in 1923. One of the causes of this large increase, it was explained at the meeting, was the greater number of patients under the Sussex Provident Scheme, from which the institution received £117 as against £57 in the previous year. The finances for 1924 showed an excess of income over expenditure amounting to £21 8s. 5d. Colonel Norman C. King, Registrar of the Dental Board of the United Kingdom, presided over the meeting.

MANCHESTER CANCER CAMPAIGN.—Dr. R. Veitch Clark, medical officer of health, has been elected chairman of the Cancer Committee on which, amongst other bodies represented, are representatives of the Health Committee of the city, University of Manchester, Radium Institute, Royal Infirmary, Union Infirmary, St. Mary's Hospital, Ancoats Infirmary, Skin, Northern, and Jewish Hospitals. Arrangements were made for the election of subcommittees comprising men and women specially qualified to deal with the problem. The committee has the approval of the Ministry of Health, who recommend that various questions arising out of a cancer campaign should be periodically reviewed. These questions refer to improved facilities for clinical consultations and pathological examinations, and for cancer treatment (operative, or with X ray and radium apparatus). The adequacy of arrangements at hospitals and institutions serving the area, and for transport of patients, should also be inquired into, and arrangements made for post-graduate demonstrations for the use alike of medical men practising in the area and of the public.

Notes, Comments, and Abstracts.

CHILD LABOUR IN CHINA.

NEWS from China chiefly tells of civil war and opium, and it is not widely known that within the last 20 years Shanghai, the chief port for overseas trade with North China, has become a great industrial centre. Factories with modern machinery have been able to draw their labour from a people of whom millions are always living on the border-line of want, and the Chinese guild system, which was a fairly efficient defence against the worst effects of economic stress among such a population, has failed to adapt itself to the new order. In the absence of any control there has developed a system in which modern machinery exists alongside conditions like those of the early nineteenth century, without the legislative enactments which are an essential part of Western industrial civilisation. Shanghai is an international settlement governed by an elected Council in which the British predominate, every non-Chinese citizen being subject to the jurisdiction of his own consular court, whilst the Chinese are provided for by a mixed court in which a native magistrate sits with a foreign assessor appointed by the consuls. The Council has strictly limited powers of making regulations for the government of the settlement, and under these conditions carries on the government of some 20,000 foreigners and 750,000 Chinese. Perturbed by the state of industrial conditions, the Council appointed a Child Labour Commission, on which they were fortunate to obtain the services of Dame Adelaide Anderson, formerly H.B.M. Principal Lady Inspector of Factories. The report[1] of this Commission has attracted notice in this country and describes conditions which raise again the question how much other peoples are benefited by the adoption of Western ways. In a match factory "young children, certainly not more than five years of age, were to be seen working with almost incredible rapidity." In silk filatures children work, standing, for 12-hour shifts, with not more than an hour off for a meal, and a new form of occupational neurosis is indicated in "a peculiar and rapid up-and-down movement of the body by means of alternately relaxing and then straightening their knees."

Describing conditions during the night shift, the report says: "Rows of baskets containing babies and children, sleeping or awake as the case may be, lie placed between the rapidly moving and noisy machinery. Young children who are supposed to be working, but who have been overcome by fatigue or have taken advantage of the absence of adequate supervision, lie asleep in every corner, some in the open, others hidden in baskets under a covering of raw cotton." Sanitary arrangements are bad and accidents are frequent, whilst the extent of this child labour is shown in a statistical appendix, from which we learn that over 18,000 children under 12 years of age are employed in factories in Shanghai or its immediate neighbourhood. Those factories outside the settlement are of course under Chinese jurisdiction, and there will obviously be trouble if regulations are applied only to those within the limits of municipal authority. The difficulties of the situation are increased by the various nationalities of the owners of the factories—Chinese, Japanese, British, American, French, Italian, and Portuguese. Shanghai people are proud of their city and rightly look upon their international republic as a model from which the Chinese may learn what is best in Western methods of government. The report of this Commission, with its candour in statement and care in considering possible means of action, is an excellent piece of work, and gives assurance that both determination and administrative ability will be applied to the amelioration of the conditions it describes.

SPA TREATMENT IN THE BRITISH ISLES.

IN these columns last year a plea was entered for a comprehensive and national policy in regard to British spas which should, in the opinion of some, supply most of the requirements of British patients. Efforts are being made in many directions to develop on scientific lines the resources for treatment which can be obtained within the borders of our shores. Much good work in this direction has been done by the British Spa Federation, which now includes nine leading spas, all of which comply with a certain standard, while the courses on medical hydrology which are held annually at the London University give facilities for the systematic training of hydrologist practitioners. The third of these courses will take place during the week beginning April 27th and will include a study tour of Buxton.

In this connexion we congratulate our contemporary the *Prescriber* on having devoted its March issue to the subject of spa treatment, to which Dr. Fortescue Fox supplies a foreword expressing the conviction, based on "a rather long experience of the spas of many countries," that one especial characteristic belongs to the spas of Great Britain in that they are far more invigorating than continental spas. "Their season," he says, "coincides with the holiday time of our working classes—the manual and intellectual labourers. Indeed, the chief *raison d'être* of the British spas is, or should be, to provide a pleasant retreat and invigorating cure for jaded and failing workers." This number of the *Prescriber* is well illustrated, and the articles include notes on old-time bathing at Bath, on treatment by radio-active springs, on the brine treatment at Droitwich, and on the chemistry of the Buxton and Harrogate waters. There is also a descriptive list of spas in Great Britain, Ireland, and New Zealand.

HEALTH CONDITIONS IN HAMPSTEAD.

DURING a local health campaign in 1923 Dr. Frank E. Scrase, medical officer of health for the borough of Hampstead, read a paper on the Health of Hampstead, Past and Present which has just been published in booklet form following a special resolution of the borough council. A popular and intelligent interest in matters of public health is essential if the campaign against disease is to attain any measure of success, and this publication should certainly help in stimulating such interest. Dr. Charles F. J. Lord, the first medical officer of health for Hampstead, used to complain that he could not make an annual report interesting unless an epidemic occurred, but happily the modern health officer is able to make interesting reading out of a decrease in mortality-rates, as Dr. Scrase has done. After tracing the history of health in Hampstead he goes on to show that the borough can boast a death-rate which is lower than that for England and Wales as a whole, and considerably lower than that for London. The death-rates for certain important diseases, excepting that from cancer, all show a satisfactory decrease within recent years. The infantile mortality-rate for 1922 was the eminently satisfactory figure of 56, but Dr. Scrase insists that this may be lowered still further by attention to the two cardinal principles of breast-feeding and pre-maternity supervision. In the report for the year 1858 Dr. Lord referred to the numerous houses and courts which required thorough eradication: he wrote then "a devastating fire would finally prove a blessing to the parish." Dr. Scrase points out that some of the premises which called for this drastic opinion still exist and still want wiping out. The density of population for the Kilburn Ward is above the average for London, and overcrowding in certain districts is still appallingly prevalent, so that despite the record for health which Hampstead has attained there still remains plenty of work to be done. A child born in Hampstead to-day can expect 12 more years of life than its grandparents: with further progress along enlightened lines the child of two generations hence may quite well be able to boast as much.

HYGROMETRIC TABLES.

THE Meteorological Office has prepared a set of hygrometric tables[1] computed on the basis of Regnault's formula to replace those, prepared by the late James Glaisher, F.R.S., which have been in use hitherto in this country. Tables based on Regnault's formula are already in general use in other countries; this formula, unlike Glaisher's, can be supported by physical reasoning. The new tables are arranged for temperatures in Fahrenheit degrees and vapour pressures in millibars, and they have been computed for a mean atmospheric pressure of 1000 millibars. They are conveniently arranged to give as rapidly as possible the relative humidities, the vapour pressures, and the dew points corresponding with a given range of temperatures of the dry bulb and of "depressions of the wet bulb," the thermometers being exposed in Stevenson screens. The tables are not suitable for use with thermometers exposed indoors—e.g., in factories or storerooms—unless precautions are taken to secure adequate motion of the air over the thermometers by fanning or otherwise. Systematic errors may also be introduced by the use of the tables in climates where the air is hot and dry and calms are of frequent occurrence. In this country, of course, a "calm" rarely prevails inside a Stevenson screen freely exposed; under all atmospheric conditions, even on occasions of strong wind in the open because of the nature of the screen, the velocity of the air past the bulbs in the screen is likely to be of the order of that comprised in the group "light airs." It is for such

[1] Reprinted by the Industrial Committee of the National Christian Council, 23, Yuen Ming Yuen Road, Shanghai, China, 1924.

[1] Hygrometric Tables for the Computation of Relative Humidity, Vapour Pressure, and Dew Point from Readings of Dry and Wet Bulb Thermometers Exposed in Stevenson Screens. (M.O. 265.) H.M. Stationery Office. 1s. 6d.

conditions as are prevalent in the Stevenson screen in this country that the tables are compiled. It is obviously advantageous to employ tables giving results which agree closely with those prevailing in other countries and are, at the same time, founded on the most accurate reasoning. The tables will be brought into use for the preparation of data for publication from the Meteorological Office as from Jan. 1st, 1925.

BRITISH PRESTIGE ABROAD.

UNDER this title Messrs. Cubitt's Engineering Co., Ltd. (55 and 56, Pall Mall, London S.W. 1), announce their intention in a communication to THE LANCET of supplying a certain number of copies of a recent book by Dr. E. Halford Ross, entitled "To Venice and Back in a Two-Seater," at the reduced price of 3s. per copy, postage paid. They hope that other British manufacturers will follow the example of issuing similar propaganda, either by circulating this book or in other ways, the idea being that owners of British cars would thus be encouraged to tour abroad and maintain British prestige. There is something arguable here, but the intention is excellent.

THE PROVISION OF SURGICAL APPLIANCES FOR THE POOR.

THE Surgical Supply Depôt at 23, Upper Phillimore-place, Kensington, London, W. 8, is an institution which exists to provide approved surgical appliances at cost price or less to those who require such and whose purses are shallow. The work is not carried on for profit, most of the workers are unpaid, and the depôt is supported by voluntary contributions. The depôt originated as the Kensington War Hospitals Supply Depôt, and during the war it was of great value to hospitals and surgeons. The management are eager to enlarge the scope of their activities and would welcome the coöperation and interest of medical men and nurses all over the country. Anyone desiring to see the depôt and how the work is done there will be welcomed, or an illustrated catalogue will be sent free on application. All communications and inquiries should be addressed to the hon. secretaries.

CATALOGUE OF WIRELESS APPARATUS.

WE have received from Messrs. A. J. Stevens and Co., Ltd., Walsall-street, Wolverhampton, a catalogue of wireless receiving sets, valves, condensers, wireless masts, headphones, and so forth. What appears to be a useful piece of apparatus is the Patent Rejector Circuit, price £2 5s., by which it is claimed the near-by stations, however close, can be cut out and any other station tuned in at will. The price of the receiving sets vary from £17 to 50 guineas and they are made in handsomely finished cabinets. Broadcasting is being more and more used in hospitals and nursing homes as a means of entertaining patients, and some of the apparatus in the catalogue are suitable for hospital as well as for private use.

COLONIAL HEALTH REPORTS.

JAMAICA.

IN the report for 1923, signed by Colonel the Hon. H. Bryan, C.M.G., D.S.O., Colonial Secretary, it is stated that the estimated population of Jamaica at the close of the year was 894,576. 3384 marriages were registered during the year, the rate being 3·8 per 1000 of population. In the same period 34,077 births were registered, of which 17,315 were boys and 16,762 were girls. The birth-rate works out at 38·2 per 1000, as against 37·3 during 1922. 20,278 deaths were registered, of which 10,061 were males and 10,217 females, the death-rate being 22·7 per 1000, as compared with 22·9 in the previous year. 7308, or 36·0 of the total deaths, were those of children under 2 years of age; and of these 5839 were those of children under 1 year of age. The principal causes of deaths (per 1000 of total deaths) amongst the inhabitants of Kingston, the capital, were: Diarrhœa and enteritis, 9·4; atrophy, icterus, and scleroma of the new-born, 11·3; phthisis, 9·5; enteric fever, 6·0; pneumonia, 5·1; heart disease, 6·9; chronic Bright's disease, 3·6; cerebral hæmorrhage, apoplexy, 4·6. The Rockefeller Foundation continued their campaign with a view to the eradication of hookworm in the island. On the withdrawal in 1926 from the colony of the Foundation, the Central Government propose to carry on the campaign for treatment. The parochial boards have recognised the advantages that are derived from sanitation preparatory to treatment for hookworm, and provision of latrine accommodation on approved lines must have the most beneficial results on the health of the colony generally. Arrangements have been made for the appointment of full-time medical officers of health for the parishes of Clarendon and St. Andrew, and a junior sanitary medical officer was appointed during the year under review, who will supervise the sanitary work in the western part of the island. Alastrim still exists in some of the parishes, and general vaccination continues to be carried out extensively. The campaign against yaws is progressing most satisfactorily. Treatment of venereal disease is receiving attention and a special clinic has been established in Kingston. Notifications of typhoid fever have shown a progressive diminution since 1921. The mean island rainfall for the year 1923 was 57·45 inches, showing a large deficiency when compared with the 50-year average of 76·46 inches. In Kingston the mean temperature for the 12 months was 79·2°, the average for 33 years having been 78·7°. Slight earthquake shocks were reported in January, June, July, August, September, and December, but none during the other months.

UGANDA.

The population of this Protectorate on Dec. 31st, 1923, was estimated to be 3,127,455, composed of 1289 Europeans, 6521 Asiatics, and 3,119,645 native inhabitants. The territories comprised in the Protectorate lie between the Belgian Congo, the Anglo-Egyptian Sudan, Kenya, and Tanganyika. Uganda is flanked on the east by the natural boundaries of Lake Rudolf, the river Turkwel, Mount Elgon (14,200 feet), and the Sio River, running into the north-eastern waters of Lake Victoria, whilst the outstanding features on the western side are the Nile watershed, Lake Albert, the river Semliki, and the Ruwenzori range (16,794 feet), and Lake Edward. The annual report states that the health of the natives, both bodily and mental, is receiving closer attention; immense strides have been made in affording better facilities for medical treatment, and in so far as education is concerned a comprehensive scheme has now been devised supplementing work at present carried out by missionary societies. Vital statistics for Buganda and the neighbouring Bantu districts record an excess of births over deaths, although in Buganda and Bunyoro the number of deaths exceeds the births. The figures for the year 1923 show that satisfactory progress has been made in reducing the proportion of still-births. Wide expansion has taken place in the treatment of native diseases, particularly venereal diseases. With a view to bringing medical treatment within the reach of natives throughout the Protectorate a system of sub-dispensaries in charge of trained native attendants is being established. Those already established, numbering 27, have proved at once successful and popular with the natives. A total of 184,601 cases received medical treatment, as compared with 116,600 cases in 1922. During the year 74 cases of blackwater fever occurred, 17 of which were fatal, the corresponding figures for 1922 being 83 and 14 respectively.

The climate of the Protectorate as a whole, though pleasant, cannot be considered healthy for Europeans. European children as a rule thrive in infancy, but considerable risk is attached to bringing them out when they are over 2 or 3 years old, as they are liable to attacks of malaria and the resultant anæmia. The health of adults depends mainly on their mode of life; with care constitutional health should not be impaired, but if physical fitness is maintained the altitude and proximity to the Equator combine to produce nervous strain after prolonged residence. Outdoor manual labour is dangerous for Europeans, and on plantations a manager's or owner's duties are for the most part supervisory. The mean maximum temperature for most districts averages 80° F. and the mean minimum 60°. On the Ruwenzori range there is extreme cold with perpetual snow, and it is also cold on the higher slopes of Mount Elgon. In the Nile valley, near Lake Albert, on the other hand, the mean maximum temperature is 90° and the mean minimum 74°. The favourite localities for European plantations are the Buganda Province (particularly the Mengo and Mubendi districts), the Toro district of the Western Province, and the Bunyora district of the Northern Province. There are a few estates in Busoga (Eastern Province), but this is not so popular. The rainfall at Entebbe during 1923 amounted to 89·04 inches distributed over 160 days—the highest rainfall recorded in the Protectorate. Two main rainy seasons are anticipated annually. The first, the "long" rains, usually begin in March and may continue through June; the second, or "short" rains, in September and extend through October and occasionally November. Much of the rain falls during the night or early morning. Violent thunderstorms and heavy showers occur frequently in the daytime, but these are only of local incidence.

NOTTINGHAM HOSPITALS. — During the next 18 months Nottingham General Hospital will be greatly extended at a cost of £72,000.—The Nottingham and Midland Eye Infirmary is in the unusual position of having money in hand but a deficiency of patients, and the chairman of the committee at the annual meeting of the governors appealed for an increase in the number.